

Chemical Week

August 20, 1955

Price 35 cents



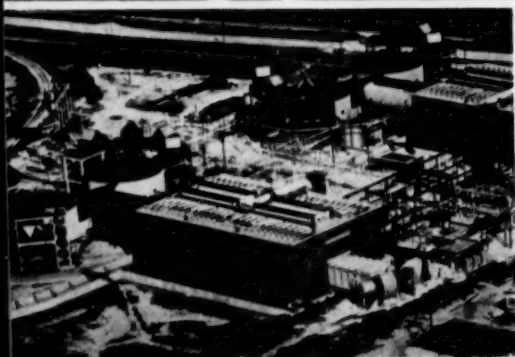
► Booming Canadian industry beckons U. S. capital; here's how firms are going about investing . p. 38

There'll be a nuclear shortage—not of fuel, not of know-how, but of trained manpower p. 54

CW survey of specialties makers uncovers few worries, lots of activity, bright outlook . . . p. 64

Switch to synthetic sweeteners lures new makers, fosters new formulations p. 72

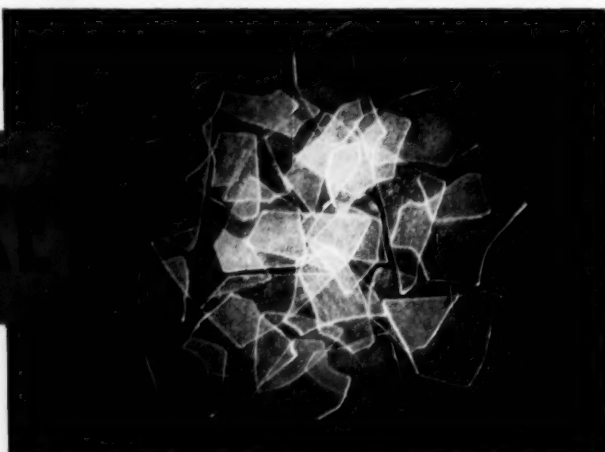
► Bromine production scales record heights, may go higher; but the long-term view is hazy . . . p. 83





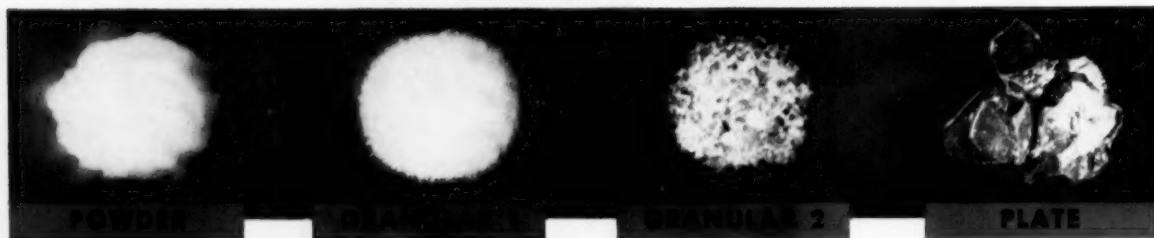
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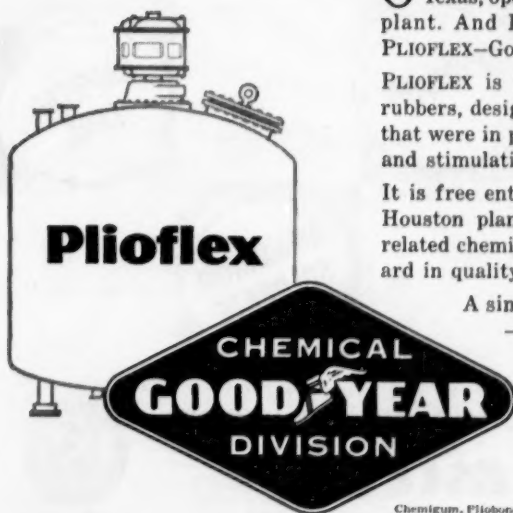
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Chemical Week

Volume 77

August 20, 1955

Number 3

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Chemical Week (including Chemical Specialties and Chemical Industries) is published weekly by McGraw-Hill Publishing Company, Inc. James H. McGraw (1860-1948), founder, Executive, Editorial and Advertising Offices: McGraw-Hill Building, 350 W. 42nd St., New York 36, N. Y. Publication Office: 1300 Noble St., Philadelphia 23, Pa. Donald C. McGraw, President; Paul Montgomery, Executive Vice-President; Joseph A. Gerardi, Vice-President and Treasurer; John J. Cooke, Secretary; Nelson Bond, Executive Vice-President, Publications Division; Ralph B. Smith, Vice-President and Editorial Director; Joseph H. Allen, Vice-President and Director of Advertising; J. E. Blackburn, Jr., Vice-President and Circulation Director.

Subscriptions to Chemical Week are solicited from management men in the chemical process industries. Position and company connection must be indicated on subscription order. Address all subscription communications to Chemical Week Subscription Service, 350 W. 42nd St., New York 36, N. Y., or 1300 Noble St., Philadelphia 23, Pa. Allow one month for change of address.

Single copies 35¢ except Annual Buyer's Guide issue, priced at \$2.50. Subscription rates—United States and Possessions \$5.00 a year; \$8.00 for two years; \$10.00 for three years. Canada \$6.00 for a year; \$9.00 for two years; \$12.00 for three years. Other Western Hemisphere Countries \$15.00 a year; \$25.00 for two years; \$35.00 for three years. All other countries \$25.00 a year; \$40.00 for two years; \$50.00 for three years. Second class mail privileges authorized at Philadelphia, Pa. Copyright 1955 by McGraw-Hill Publishing Co. Inc.—All rights reserved.

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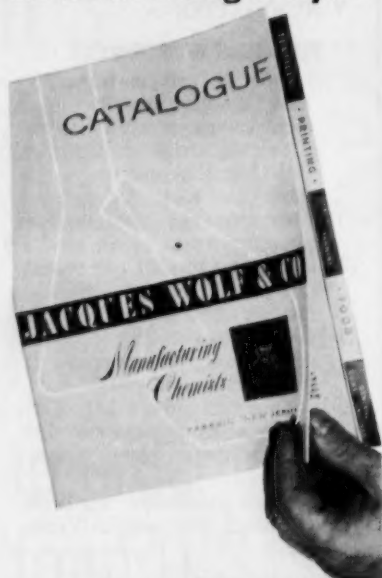
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A Complete Chemical Specialties Inventory at Your Fingertips!



Throughout the pages of the new, completely revised and simplified Chemical Catalog you will find a distinctive and definite line of Jacques Wolf auxiliaries in condensation—enzymes, detergents, water-repellents, wetting agents, oils, gums, and many other specific chemicals for the textile, leather, food, brewery, lithographic, pharmaceutical, cosmetic and allied industries.

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OPINION

Not for Delegation

TO THE EDITOR: I read with a great deal of interest your feature on PI radio (July 9).

. . . WCKY is not represented by Dwight & Associates of Chicago. This company is an outstanding firm, and John Hopkinson is a good friend of ours; however, WCKY feels that the quality and selection of items to be offered to our listeners is a function of our management and cannot be delegated.

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C. H. TOPMILLER
Executive Vice-President
WCKY
Cincinnati

'Otherwise Inaccurate'

TO THE EDITOR: It was a pleasure to read your calcium carbide article (July 30).

I have received several favorable comments within my own organization and I am sure that the balance of the industry is thankful that you have straightened out an otherwise inaccurate situation in current literature.

W. S. WALKER
Manager—Carbide
Linde Air Products Co.
New York

Another Nitrogen Angle

TO THE EDITOR: I was very much interested to read your article entitled "Too Much Or Just Enough" (July 9).

I was particularly interested to note the second paragraph from the end in the first column on p. 74, concerning the use of ammonium sulphate in higher - nitrogen - containing mixes. Our company represents the Chemical and Industrial Corp. of Cincinnati, O., in building the complex fertilizer plants of the Potasse et Engrais Chimiques French Process. We thought you would be interested to know that we are building a plant in Taiwan to make 100 tons of 16-

14-0 fertilizer using nitric acid and ammonia to obtain the nitrogen content. No ammonium sulphate is required and you will see that higher analyses are possible than with the mechanical mixing. In addition, production cost is much lower. C&I is also designing and constructing three similar plants in the U.S.

It is our opinion that the mechanical mixing using the ammonium sulphate has largely been superseded by the new nitrophosphate processes.

C. F. BURNAP
Technical Director
Sharples Chemical & Industrial Ltd.
Nassau, Bahamas

Twin-City Rivalry

TO THE EDITOR: I appreciated the recent article titled "Soft Touch is Tough to Sell" (July 30). . . . The product Softize (not Sof-Tize) is manufactured by Avochem, Inc., in Minneapolis. You give Economics Laboratories in St. Paul the credit for producing such a fine product. Softize is currently retailed in the five-state area of Minnesota, Wisconsin, Iowa, North Dakota and South Dakota.

. . . We appreciate your alertness in publishing such a fine report at this time.

OWEN A. MOE
President
Avochem, Inc.
Minneapolis

DATES AHEAD...

American Soybean Assn., Natl. Soybean Processors Assn., joint meeting, Netherlands Plaza Hotel, Cincinnati, Aug. 29-31.

National Agricultural Chemicals Assn., annual meeting, Essex and Sussex Hotel, Spring Lake, N.J., Sept. 7-9.

Federal Wholesale Druggists Assn., annual meeting, Greenbrier Hotel, White Sulphur Springs, W. Va., Sept. 11-14.

CW welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.

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W. A. Jordan, Chemical Week 330
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NEWSLETTER

Prosperity received an official stamp of recognition from the Manufacturing Chemists' Assn. this week with release of tentative first-half industry sales records.

During the first six months of 1955, MCA says, chemical and allied products sales totaled \$11.5 billion—an 18% increase over sales of \$9.7 billion for the same period last year.

The industry continues, moreover, to be the nation's No. 3 industrial taxpayer—paying in excess of \$735 million in federal taxes from January through June.

•
Add one more potential primary aluminum plant to the long list of forthcoming units due for construction (CW, Aug. 13, p. 14).

Revere Copper & Brass, Inc., is requesting a certificate of necessity for construction of a \$53-million plant at Wenatchee, Wash., to turn out about 60,000 tons/year of ingot aluminum.

For one of the future aluminum plants now in planning stages, there's a progress note: Kaiser Aluminum & Chemical has agreed to do preliminary engineering studies on the proposed Wells Dam on the Columbia River in Washington. If the studies appear favorable, Douglas County Public Utility District will undertake to finance and construct the dam; and Kaiser will then consider building an aluminum reduction plant there.

•
First concrete step toward merger of two of the principal labor unions in the chemical process industries came late last week in St. Louis at the close of the 12th annual convention of the International Chemical Workers Union (AFL):

Apparently convinced that unification is in the cards, ICWU delegates authorized their president—Edward Moffett—to appoint a committee to enter into preliminary merger talks with a corresponding committee from CIO's Oil, Chemical & Atomic Workers. This move followed reading of a telegram from OCAW President O. A. Knight, who declared that "unity in action (in the oil and chemical fields) is greatly needed," and that "a vast organizing job lies ahead."

•
More phosphate is moving into trade channels this week, now that ICWU has reached agreement with four of the eight Florida phosphate producers that had been strikebound for more than two months.

Following the Coronet and American Agricultural Chemical settlements, Virginia-Carolina Chemical and Armour Fertilizer Works signed up with the union on similar terms: wage increases averaging 8.6¢/hour now and an additional 4¢ rise next May 15.

•
International competition isn't going to be limited to the atomic energy field (see p. 12); it's making itself felt in chemicals right now. Nor will the Transatlantic rivalry be one-sided.

Last fortnight, Imperial Chemical Industries, Ltd., of Britain, said it was ready to go into titanium production in the U.S. in partnership with Columbia-Southern (CW, Aug. 13, p. 14)—titanium being an item of which Union Carbide expects to be a major producer (CW Market Letter, Aug. 13).

Now, Union Carbide says it's going into production of polyethylene in Britain, where ICI has been the sole producer. ICI's polyethylene by high-pressure polymerization patent will expire next February; and by summer of 1957, Carbide plans to have a 26-million-lb./year plant onstream near Grangemouth, Scotland. The plant will be operated by GEMEC Chemicals and the output will be sold by Bakelite Ltd., both subsidiaries of Union Carbide Ltd. By then, Carbide's total polyethylene capacity—U.S., Canada and United Kingdom—is expected to be 290 million lbs./year.

•

German exports of chemicals continue to spiral upward—attained a value of DM 341 million in the first five months of 1955.

Largest market for Germany is still Europe—which is absorbing some 70% of the chemical industry's out-of-country sales. But exports from West Germany to Australia have soared more than 40% during the first half of 1955—bid to increase even further over the next six months.

•

First U.S. project aimed at building an atomic power plant outside the continental limits now seems a solid possibility:

General Public Utilities Corp. has received an access permit from Atomic Energy Commission for classified information relating to atomic power plants and plans first to probe construction in the Philippines.

Reason for the company's interest: Philippine power rates are almost double average in the U.S.; availability of such power would considerably enhance industrialization.

•

Within the next few weeks the Japanese Diet is expected to jerk the rug out from under Japan's economic democratization program, thereby virtually removing all restrictions on the formation of cartels.

Thereafter, observers predict, more consolidations on the order of last July's merger of three ex-Mitsui Zaibatsu trading firms are apt to occur. Impact of this trend on U.S. chemical producers could be far-reaching.

Daiichi Bussan (the name given to the ex-Mitsui combine) now controls more than 10% of Japan's foreign trade; overseas dealings involve more than 1,000 export and 500 import items in the metal, chemical, textile, fertilizer, machinery, and pulp and paper fields.

•

Other sobering news comes from Office of Defense Mobilization:

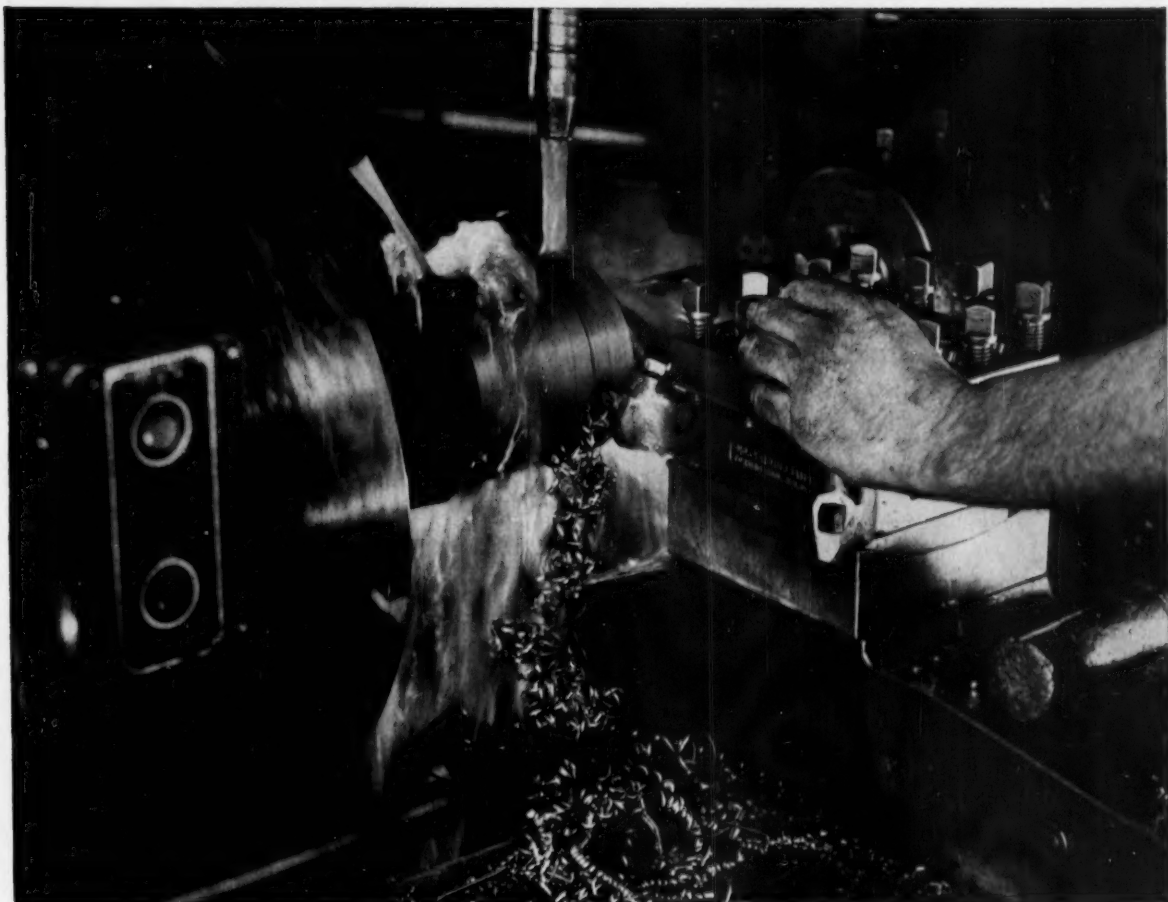
ODM's committee on railroad equipment advises that some 6,000 additional tank cars would be needed in case of mobilization (for transport of chemicals, petroleum products, etc.), and offers a plan for government stockpiling of component car parts.

Significant feature of the plan: a revolving withdrawal system, whereby car builders could withdraw parts from the stockpile as needed—payment for which would keep the federal-financed stockpile self-supporting.

•

Fluoridation of the world's drinking water took a big step ahead earlier this week when one of civilization's oldest cities and one of its youngest decided to fluoridate public water supplies.

Cairo, Egypt, and Toronto, Canada, are the latest cities to institute fluoridation as a public health measure; the global front in the war on dental caries now extends to Brazil, Chile, Colombia, Germany, Holland, Japan, New Zealand and Sweden.



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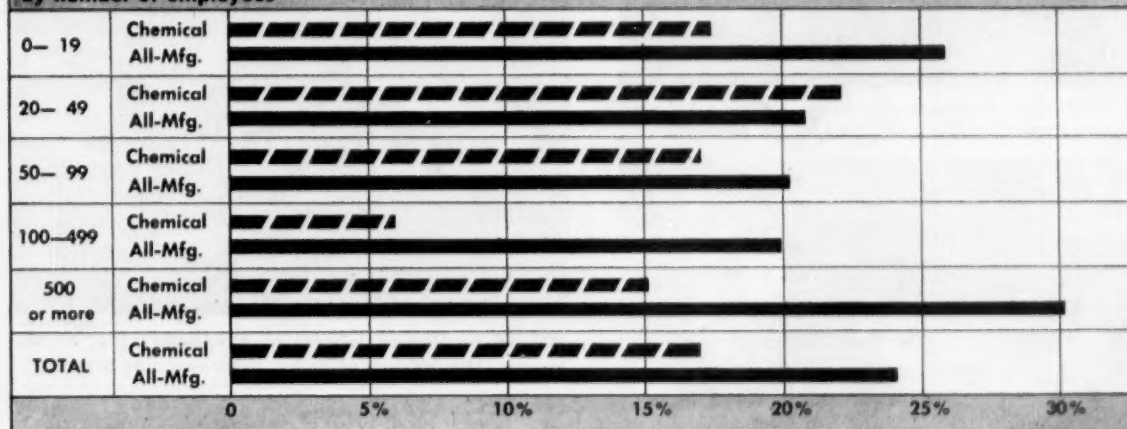
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BUSINESS & INDUSTRY. . . .

CHEMICAL EXPANSION: FAST, BUT NOT RECKLESS*(Percent of increase in number of establishments of various sizes, 1946 to 1953 — chemicals and allied products vs. all manufacturing industries)*Size of establishments,
by number of employees**Steady Growth—But With Calm Caution**

How chemical expansion is shaping up in the postwar years—that's what the U. S. Dept. of Commerce (Business & Defense Services Administration) spotlights in its latest report.

And from BDSA's most recent chemical industry study, it's apparent to chemical circles this week that, on the whole:

- Over-all chemical growth has

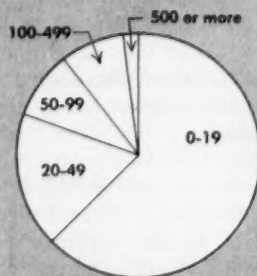
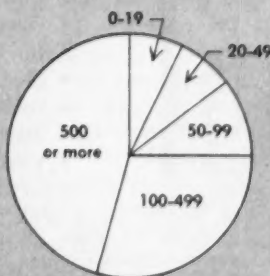
been maintaining a swift, steady pace—a plant-building pace that's rather conservative as compared with other manufacturing buildups (17% vs. 24.2%).

- More than 12,000 establishments in the U. S. are making and selling chemical and allied products.

- Number of smaller chemical units (under 99 employees) is increasing about the same rate as the total of the largest plants (500 or more).

- The slowest growth is in medium-sized establishments (100-499 workers); fastest, on the other hand, in the 20-49 workers/plant size.

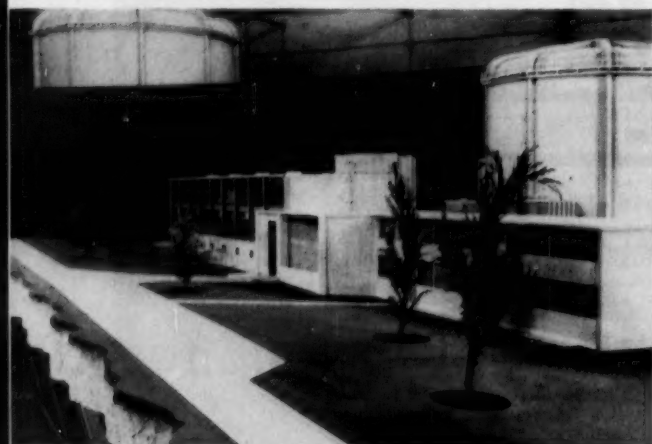
- Close to 63% of all chemical establishments are small (0 to 19 people), account for less than 6% of industry labor forces. But large units—with 500 or more employees apiece—answer for only 2.1% of the number of plants, yet clock 47.1% of the manpower.

CHEMICAL INDUSTRY AT A GLANCE**I. Its plants:**Distribution of establishments
of various sizes (1953)**II. Its personnel:**Distribution of employees
in establishments of various sizes (1951)

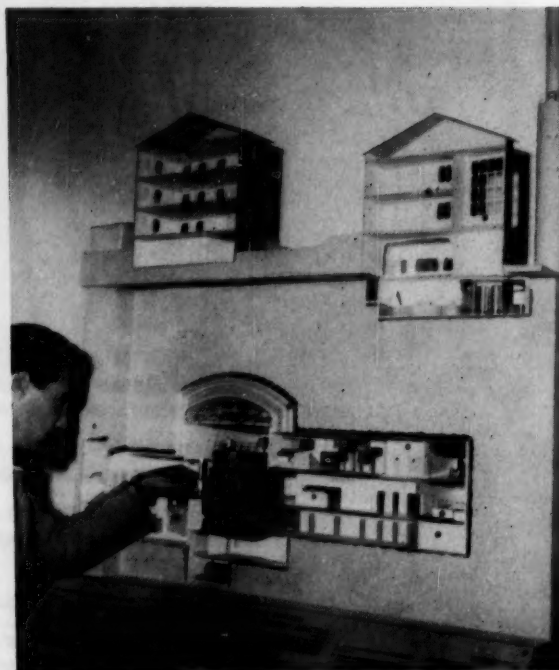
Geneva: Nations Seek Peaceful Atom Way . . .



U. S.: Center of attraction is Union Carbide's full-scale operating reactor, publicly displayed for the first time.



BRITAIN: Model 'Dido' prototypes research reactor at Harwell for U.S. and world visitors to Geneva.



SWEDEN: Replica (above) of Stockholm's first atomic reactor. The 300-kw. plant has been operating a year.

. . . And Bid for Prestige

The international race for prestige and profits in atomic energy is being resumed by national governments and private industrial companies this week after last week's "Atoms for Peace" conference—staged by the United Nations in Geneva's Palais des Expositions—gave contestants a chance to see how their present and potential competitors are doing.

To the U.S. went the honor of having the largest national display and of submitting the largest number of scientific papers; and to a U.S. chemical company—Union Carbide and Carbon Corp.—went the credit for setting up the largest and probably most popular exhibit of any private company.

Other U.S. chemical process firms participating:

- Brush Beryllium Co. (Cleveland).
- Corning Glass Works (Corning, N.Y.).
- Harshaw Chemical Co. (Cleveland).
- Lindsay Chemical Co. (West Chicago, Ill.).
- Phillips Petroleum Co. (Idaho Falls, Idaho).
- Radioactive Products, Inc. (Detroit).
- Tracerlab, Inc. (Boston).
- Vitro Corp. of America (New York).

As for the rest of the show, U.S. and British firms ran neck and neck in the number of their displays (26/country) dressing up the atomic "supermarket." France was out in front with 49 eye-catchers, and Switzerland tagged along with some 24.



U. S. S. R: Seeking to emphasize their atomic knowledge, Russians sport a model of their 'going' reactor.

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Beryl
Chromite, metallurgical
Chromite, refractory
Compressed gas cylinders
Cryolite

Fluorspar, acid grade
Manganese ore, metallurgical
Methanol, synthetic
Portland cement
Rare earths
Tungsten
Zinc

GOALS SUSPENDED—NO MORE CERTIFICATES NOW

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Antimony
Bauxite
Chromite, chemical grade
Cobalt
Coke, by-product
Cryolite, synthetic

Electrolytic tin plate
Glycerine
Taconite
Manganese ore, chemical grade
Petroleum
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Mercury
Nickel

Facilities for military and
atomic energy procurement
Selenium
Titanium melting facilities
Titanium processing
facilities

'Go Slow' Signal for Speedup Plan

The government's fast tax write-off program is being sharply cut back—and chemical companies are among those that'll be hit (see box, above). The Office of Defense Mobilization has closed 19 goals—which means no more fast tax amortization for firms that want to expand their production facilities. It will continue to issue certificates of necessity, however, for companies that want to expand output of 20 materials or items, including those listed above.

A decision on the future of fast write-offs for some 38 industries is under consideration. Some of these will be made eligible once again; most however, are expected to be closed out.

Month-Long Review: ODM Director Arthur Flemming—whose slowdown order came last week just less than one month after Secretary of the Treasury George Humphrey had told Congress that the program might be costing more than it's worth—has indicated that the whole program will be under review for a month or more.

Some of the suspended incentives may then be restored, but the general outlook is that there'll be little more federal support in the plant-building boom that started in 1950. This will mean that industry will want to reconsider future expansion plans, determine if they'll still be worth the candle.

At last count, ODM had 29 applications for amortization certificates for chemical plants costing \$53 million. However, this includes projects for which amortization goals had already been closed.

Of the chemical and related goals still open, the objective for titanium melting facilities is 29,000 tons of new capacity (on which "fair" progress is reported). For titanium processing facilities, the goal is 37,500 tons of capacity (with "poor" progress reported).

Goal for alkylate is secret.

For metals and minerals still on the open list, ODM has no specific goals but is approving all the expansion that anyone wants to build.

New Faces in FTC

Whether the Federal Trade Commission will take a tougher line on mergers now that member John Gwynne has been designated to succeed Edward Howrey as chairman is the question that's intriguing management this week.

Howrey—head of the agency since about two months after the Eisenhower Administration took over—has resigned to return to his lucrative Washington law practice. With Gwynne moving up to the chairmanship, the President has picked former Gov. Sigurd Anderson of South Dakota to fill the vacancy in the five-man commission.

Gwynne, a lawyer and one-time judge, has been an FTC commissioner since Sept. '53. Possible clue as to his philosophy on how the business community should be policed: Gwynne was a Republican congressman from Iowa from 1935 to '48, an active member of the House Judiciary Committee; and on that committee, he was a leading GOP supporter of the bill that eventually was enacted in 1950 as the "antimerger amendment" to the Clayton Act.

Although Howrey has been criticized by Democrats who say the FTC should be more aggressive in enforcing the Sherman and Clayton Acts, FTC says its volume of antimonopoly and antideceptive practice activities this year "substantially exceeds" the previous 10-year average.



FTC'S GWYNNE: For 1950 anti-merger amendment, a leading booster.

EXPANSION

Gypsum Products: Kaiser Gypsum Co. will build a second gypsum products plant at Pittsburg, Calif., to replace its Redwood City plant, destroyed by fire last June 23.

The plant will be built adjacent to Kaiser's \$5-million plant (now under construction) at Pittsburg, will give the company a combined annual capacity of 274 million sq. ft. of gypsum board products and 20,000 tons of plaster.

Fertilizer: Contracts have been let for construction of Northwest - Nitro Chemicals' \$23-million fertilizer plant near Medicine Hat, Alta.

Cosmetics: Warner-Lambert Pharmaceutical Co. has started construction of a multimillion-dollar plant at Lititz, Pa., completion of which is expected by June 1, '56.

Synthetic Catalyst: Davison Chemical Co. Division of W. R. Grace & Co. is building a \$6-million plant at Valleyfield (near Montreal, Que.) to produce synthetic fluid petroleum cracking catalyst; completion date: March '57.

Coke By-products: Youngstown Sheet & Tube plans to begin construction next week of a 75-oven addition (cost estimated by outsiders at more than \$9 million) to its Indiana Harbor, Ind., works. Completion—set for Sept. '56—will bring the company's Chicago-area coke capacity to 2 million tons/year.

COMPANIES

Harshaw Chemical Co. directors have proposed a two-for-one split in the company's common stock. Authorized common stock would thereby be increased to 1.5 million (from 600,000) shares.

Upon stockholder approval (at the firm's next annual meeting in January) management would also apply for listing of the shares on the New York Stock Exchange.

Broadening still further its manufacturing operations, General Tire & Rubber Co. is now looking toward merger with a maker of shoe materials, electrical and other kinds of tapes, insulating materials and specially treated fabrics. General Tire stock-

holders are expected to approve the proposed acquisition of Respro, Inc. (Cranston, R.I.), whose stockholders have already o.k.'d the move. Plans call for issuing one share of General Tire 5% cumulative preferred stock (\$100 par) for 6.25 shares of Respro capital stock.

Purex Corp. Ltd. (South Gate, Calif.) has sold a \$3-million, 4½%, 15-year promissory note at 99.152 to Prudential Insurance Co. of America. About two-thirds of the principal will be

used to pay Prudential on previous notes; the rest will go into working capital to help cover increased operating costs resulting from last May's acquisition of Cudahy Packing's Old Dutch Cleanser Division.

Recent company incorporations (all in Delaware):

- Mevi Chemical Corp., with authorized capital stock of 1,000 shares, no par value.

- Acorn Paint & Chemical Co., authorized capital stock, \$100,000.



Cavorting Goats Breed Good Will

CONTINENTAL OIL CO.'S storage tanks in Louisville, Ky., are a study in contrasts these days. While on the one hand the river terminal bustles with industrial activity, goats, on the other, are quietly keeping the weeds down to a reasonable height.

From the company's point of view, letting local farmers graze their goats is a three-pronged asset. It solves an omnipresent fire hazard (and saves weed-cutting expense); it furthers Conoco's public relations; and perks up employees ("they love the little critters").

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View of main plant of
American Potash & Chemical Corporation
at Searles Lake, Trona, California

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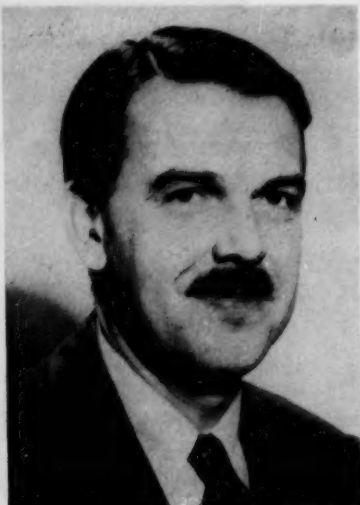
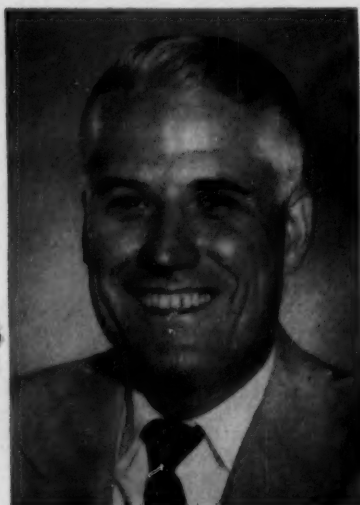
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NLRB'S FARMER, JERSEY'S GROSS: In labor relations, they point up . . .

Return to Rule by States

It's harder now for some industries to get the labor board to take up their labor-management disputes; but so far, chemical process firms have found no NLRB door closed to them.

Leaving more cases to be handled by state governments is enabling the board to give more attention to a problem that has been bothering various chemical companies—breakup of plantwide bargaining units.

Having whittled down its incoming work load by decreeing that it will leave certain types of cases to be dealt with by state agencies, the National Labor Relations Board has been getting around to some unfinished business that's of particular concern to various chemical companies.

In a number of recent chemical industry cases, the board has been pinning down the loose ends of the chemical bargaining unit policy that it formulated in rough outline last year in the American Potash & Chemical Corp. case (*CW*, March 13, '54, p. 15). That was the case in which the industry and some industrial-type labor unions had argued in favor of plantwide bargaining at chemical plants; but NLRB decided that its policy to ban craft-unit elections at steel, aluminum, logging and wet milling plants would not be extended to the chemical industry.

As anticipated, that decision led to a series of attempts by various unions—mostly of the AFL—to carve out small and medium-size bargaining units in chemical plants. Inevitably,

there was friction, usually between rival unions; and already some of those disputes have been aired before NLRB in Washington.

Novel Twist: In general, recent NLRB opinions on this problem tend

to reinforce rather than to revise the policy set out in the AmPot case (*see table*, p. 18). A craft union's request for an election will be granted if the employees concerned make up a distinct work-unit performing duties characteristic of the craft usually represented by that union.

One exception to this rule: if the plant has had a long, relatively smooth industrial relations record under plantwide bargaining, craft unions will not get a green light to carve out smaller units. In two cases, a 10-year history of satisfactory plantwide bargaining was ruled sufficient to forestall invasions by craft unions.

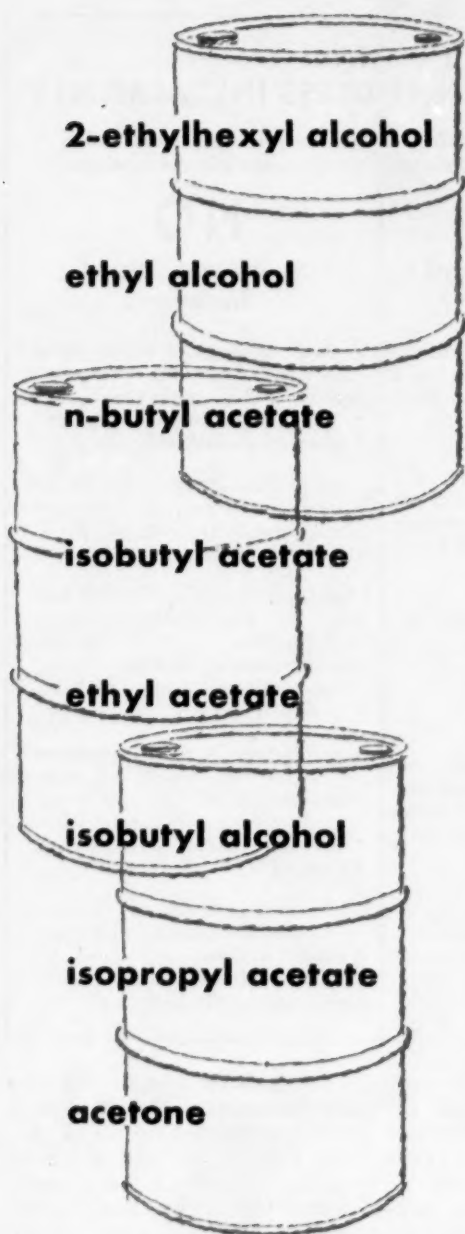
The board fielded one case that came up with "reverse English": International Chemical Workers (AFL) asked for severance of a group of plastics and mechanical products employees at an M. W. Kellogg plant where plantwide bargaining rights had been held by AFL Pipefitters. Usually, of course, ICWU advocates plantwide bargaining and the Pipefitters are generally in the role of a craft union seeking severance of a certain unit. In this case, the board agreed that ICWU should have a chance to represent the production workers. And at Binghamton, N.Y., United Electrical Workers (Ind.)—usually an industrial-type union—got permission to try to represent skilled electrical maintenance employees at a General Aniline & Film plant.

Plenty of Pitfalls: While NLRB policy on chemical bargaining units

TECHNICALITIES IN 'TWILIGHT ZONE'

Issues still unresolved under Taft-Hartley Act:

1. Employer's right to insist on contract clause prohibiting a strike unless o.k.'d by majority of employees.
2. Employer's obligation to bargain on stock purchase plan for employees.
3. Legality and effect of "hot cargo" clause permitting union members to refuse to handle products of an "unfair" employer.
4. Scope of protection afforded to employees engaging in strike activities that border on "disloyalty."
5. Employer's right to deny access to plant to nonemployee union organizers.
6. Legality of a strike while a contract is in force but in connection with a contract reopening and after 60 days' notice of intent to reopen.
7. Whether unfair labor practices as well as strikes are forbidden during 60-day notice.



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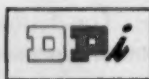
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THE SEVERANCE SERIAL: IN ENDLESS INSTALMENTS

(Recent NLRB decisions filling in details of precedent-setting ruling in American Potash case on severance of craft workers in chemical plants)

YES

**Severance ordered
because**

—powerhouse employees are in a separate department (Procter & Gamble, New York; Du Pont, Jeffersonville, Ind.)

—employees concerned are members of true craft units (American Cyanamid, Bound Brook, N.J.)

—union seeks to represent employees in its traditional craft jurisdiction (Spaulding Fibre Co., Tonawanda, N.Y.)

—industrial-type union seeks severance of production workers previously represented by craft union (M. W. Kellogg Co., Jersey City, N.J.)

—laboratory and technical employees have separate and distinct duties (Ciba Products Corp., Philadelphia)

NO

**Severance denied
because**

—maintenance employees work in close contact with production workers and no other union seeks to represent them (Associated Cooperatives, Sheffield, Ala.)

—plant has 10-year history of plantwide bargaining (Davison Chemical Co. Division of W. R. Grace, Cincinnati)

—union petitioning for election does not traditionally represent craft workers concerned (American Cyanamid, Bound Brook; Davison Chemical Co. Division, Cincinnati)

—employees in unit concerned don't exercise gamut of skills characteristic of the craft represented by the union (Grand River Chemical Division, Deere & Co., Pryor, Okla.)

—chemical analysts are considered interchangeable with production workers and need no particular training (Associated Cooperatives, Sheffield, Ala.)

is thus becoming clear and settled, there are still plenty of pitfalls for employers in certain areas of labor-management relations under Taft-Hartley. This was brought out by NLRB Chairman Guy Farmer, who recently listed seven recurring situations that still haven't been settled in the courts (*see box, page 16*).

For example, two process companies—Merck (Rahway, N.J.) and Plastic Molding (St. Louis)—were charged with discrimination for having fired an active and prominent union member. Because of different circumstances, the board ordered reinstatement in the Plastic Molding case, dismissed the case against Merck.

As an instance of how the act is subject to varying interpretation, take the recent Gerber Plastic case. Two employees were laid off, later rehired

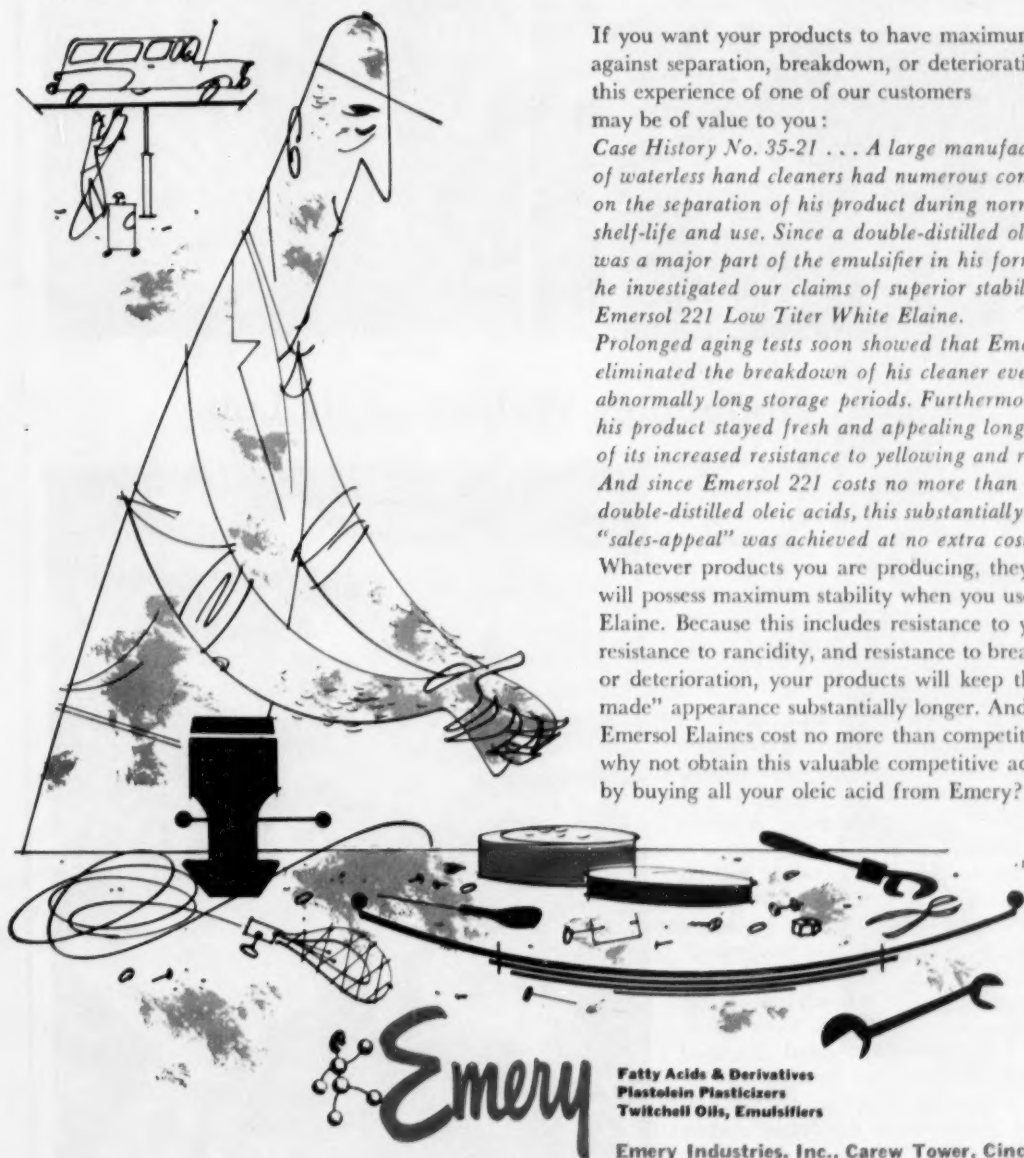
by the employer after the eligibility date but before an NLRB election. In an earlier case of this nature (Sylvania Electric), the board had ruled that such employees' ballots should be counted; but now the board has reversed that ruling.

For the most part, chemical companies have not been affected by the NLRB's year-old policy to leave more cases to be handled by state labor agencies, such as New Jersey's State Mediation Board headed by Rutgers University's Mason Gross. But many chemical firms have been affected by NLRB policies set by the present Republican majority (Farmer, Philip Ray Rodgers and Boyd Leedom), and will be anxious about the leanings of whoever will be appointed to the board to succeed Farmer, who's returning to private law practice.

spotlight on

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Case History No. 35-21 . . . A large manufacturer of waterless hand cleaners had numerous complaints on the separation of his product during normal shelf-life and use. Since a double-distilled oleic acid was a major part of the emulsifier in his formulation, he investigated our claims of superior stability for Emersol 221 Low Titer White Elaine.

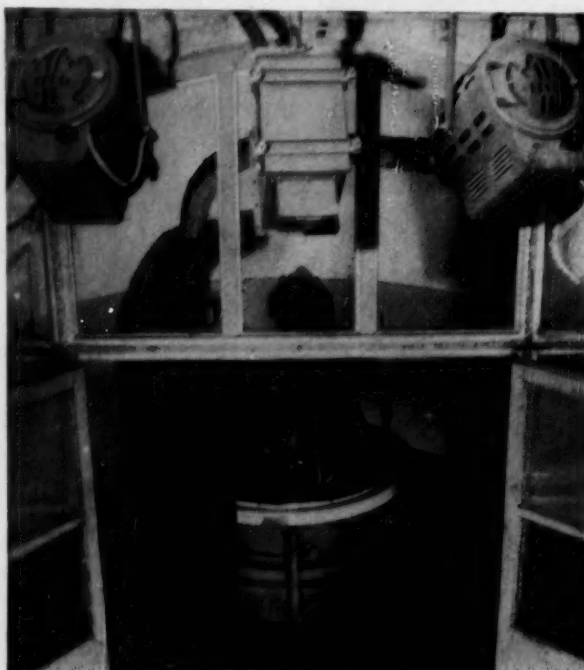
Prolonged aging tests soon showed that Emersol 221 eliminated the breakdown of his cleaner even over abnormally long storage periods. Furthermore, his product stayed fresh and appealing longer because of its increased resistance to yellowing and rancidity. And since Emersol 221 costs no more than competitive double-distilled oleic acids, this substantially greater "sales-appeal" was achieved at no extra cost.

Whatever products you are producing, they too will possess maximum stability when you use an Emersol Elaine. Because this includes resistance to yellowing, resistance to rancidity, and resistance to breakdown or deterioration, your products will keep that "just-made" appearance substantially longer. And since Emersol Elaines cost no more than competitive grades, why not obtain this valuable competitive advantage by buying all your oleic acid from Emery?

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Telecontrolled Production: Welcomed by Labor

TODAY, in Italy, at a plant originally founded by Alfred Nobel (in 1872), communism is being beaten by a new strategem.

Montecatini expected that virtually complete underground mechanization of its dynamite plant at Avigliana (*CW*, Jan. 29, p. 62) would work out smoothly as far as production was concerned; but the firm's management wasn't sure how employees would react to the risk-reducing but labor-saving scheme.

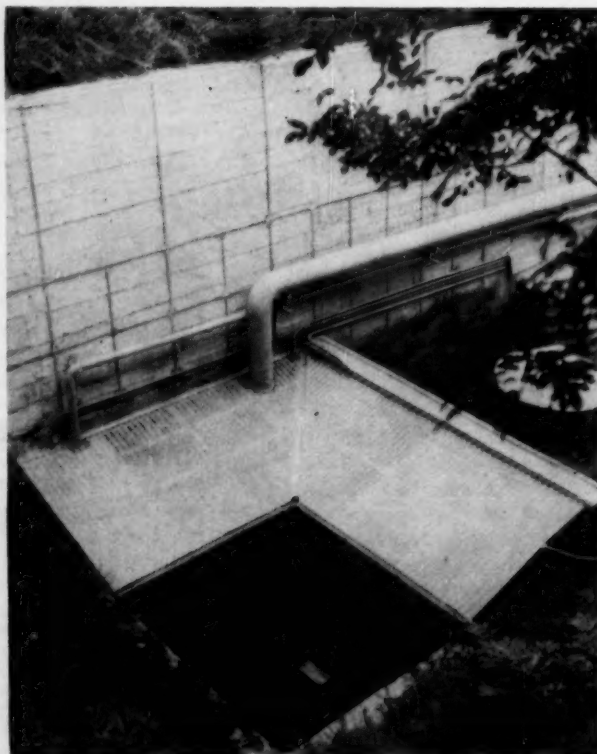
Proof of the effect of the safety move on workers: at Avigliana's most recent shop election, votes received by the Social-Communists fell off 15%.

Safety Plus: In the Montecatini Avigliana works, each kneading machine is placed in a separate cave underground, protected by foot-thick reinforced concrete, 15 ft. of earth.

Each cave (*above left*) is closed by a light partition, which is reached through a tunnel.

Both the doors that close access to the tunnels and those that close the entrances to the caves themselves are fitted with block locks—the keys to which must be placed in special boxes (*upper right*) to start the machines.

Far from being disturbed over the cut in labor force (brought on by this degree of automation), workers at Avigliana are enthusiastic—so much so that Montecatini is building a similar plant at Orbetello.



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CALLISON'S GIVENS: In spearmint oil, he's jockeying for a . . .

Switch of Allegiance

In an era when the whole trend of industry is to build producing units as close to potential markets as possible, I. P. Callison* would appear to be running somewhat counter-clockwise.

The company's latest effort—encouraging spearmint crop growing in the far Northwest, some 2-3,000 miles from Callison's main Eastern consumers—is an excellent example of this tendency.

But Callison officials have well-de-

*Seattle, Wash., botanical drug and essential oil suppliers.

fined reasons for the belief that Washington and Oregon spearmint essential oil can replace major Indiana sources. In point, they stress:

- Weather extremes (a handicap to spearmint growers) are virtually unheard of on the West Coast.

- Plenty of new land for spearmint production is available in the Washington-Oregon area. In Indiana, "muck lands" (sought for mint growing) are virtually exhausted, or have been converted to other crops to reduce plant blights.



NORTHWEST SPEARMINT: Consumer acceptance is gaining momentum.

B & I.

- Cheap irrigation is plentiful along the Columbia River valley, and uniform crop production divorced from weather vagaries can be easily fostered.

- Northwest spearmint oil yields run naturally higher per acre than in Central states (96 vs. 40 lbs./acre).

- Washington spearmint oil prices are lower (by about 75¢/lb.). Though menthol and ester contents run slightly less than central U.S. oils, careful formula adjustment can beat this seeming disadvantage.

Thus, reason Callison executives, spearmint consumers can still effect a saving—though faced with higher transport tabs.

Fostering Growth: Bulwarked by this type of logic, Callison is actively fostering spearmint cultivation by Washington farmers.

To date, the company's probably the greatest single factor in boosting spearmint acreage in the area from near-zero (three years ago) to 2,230 acres this year. It's responsible for supplying some 90% of original spearmint root stocks to farmers from its own 450-acre farm near Sunnyside (farmer: Henry Callison, in charge of company spearmint development).

Due to Increase: Of a total U.S. spearmint production of 610,000 lbs., Washington area will supply about 200,000 lbs. this year.

Moreover, because Midwest plantings are down some 20% from a year ago (due to large carry-overs), and Central states' yields are likely to drop as much as 30% (because of late frosts), Washington should have an even bigger share in the 1956 production picture. In fact, Far West spearmint oil could count for more than this year's 32.8% of the total U.S. output. (Last year the same region contributed only 22.1% of the over-all supply.)

Discussing this year's price situation, Larry Givens, Callison vice-president and general sales manager, says: "Because of carry-over from last year's bumper crop, spearmint oil prices will be somewhat lower this year." And even though total U.S. output of spearmint oil is down some 338,000 lbs. this year, there will apparently be plenty to go around (average known U.S. demand hovers around 675,000 lbs.; Wm. Wrigley Jr., Co. takes almost half).

Toughest Hurdle: Despite this rosy over-all picture, Callison still has one

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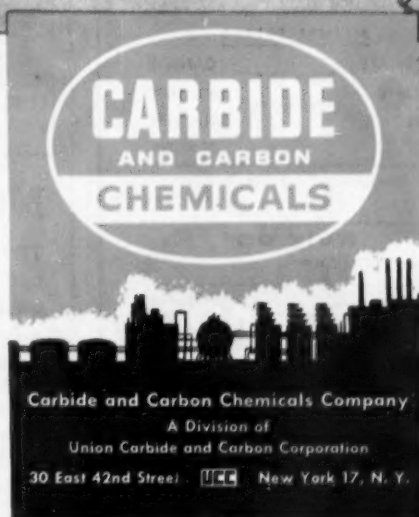
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big hurdle to cross, however.

As is true with most essential oils, flavor varies from region to region. And, it appears, Washington spearmint is somewhat sharper in taste than Midwest oil. Result: it's hard to convince spearmint users (who figure that their consumer products have acquired a distinctive taste) to change too quickly to some other oil.

How does Callison hope to surmount this obstacle? Essentially through greater sales efforts. Larry Givens is trying to familiarize consumers with the merits of Northwest oil—uniformity, reliability of supply, higher yields, lower costs. Once that's accomplished, Givens is sure Callison will increase its share of the spearmint market (just as it did with Northwest peppermint a matter of years ago).

Another Impetus: Besides Callison's own effort to expand Northwest spearmint oil production, another impetus, outside its control, could be a strong ally to spur spearmint demand.

Europeans are just awakening to the possibility of spearmint as a flavor. Two independent forces are apparently contributing to this condition. American GIs abroad are handing out spearmint gum to young fry, who are learning to like the flavor. And U.S. pharmaceutical and drug manufacturers abroad are incorporating spearmint oil in their formulations. End result: Europe could soon develop into a consumer of Northwest oils, too.

That Callison is strongly entrenched in what looks like an expanding business can't be denied. But to strengthen its stand may take a battle.

IMPACT

Baby Boom ... Bonanza for Chemicals



Moppets 'Eat Up' the Chemicals

THE EVER-INCREASING birth rate in the U.S. spells more than casual interest to chemical makers.

Now, with more than one (on the average) child of 14 or less per family, over-the-counter sales of baby oils, powders and lotions have risen 30% (over the last five years). Furthermore, this year's market for toys (20-25% of them plastic) is ex-

pected to hit close to \$1.1 billion. Taking the number of children under age 14 at 44.75 million, that means each moppet will be the recipient of some \$6 worth of plastic toys.

In addition, over 1.5 million lbs. of polyethylene will be used by children this year—a large portion of it for baby bottles.

ANOTHER WAY it pays to package in film made of BAKELITE Polyethylene



Polyethylene liner protects contents against caking due to moisture, and loss of valuable oils.



Ease of re-closing polyethylene liner maintains package tightness and is a great advantage.



Flexible Packaging Company, Chicago, Ill., made the polyethylene liners of queen film produced by The Visking Corp., Terre Haute, Ind.

"...a completely dependable packaging method"

"We know it will retain all of its flavor quality." The product in this case is food flavorings and spices made by the Wm. J. Stange Company, Chicago, Ill.

It is a sensitive product. According to F. K. Koepke, assistant sales manager, "we cannot live with anything less than a completely dependable packaging method. First, we must keep moisture out, and second, loss through absorption by the container itself of flavor-giving oils must be minimized."

Using a polyethylene liner, "we seal every bit of our laboratory flavor and spice right where we want it. More than this, the liner protects flavor at the customer's location — generally kitchens

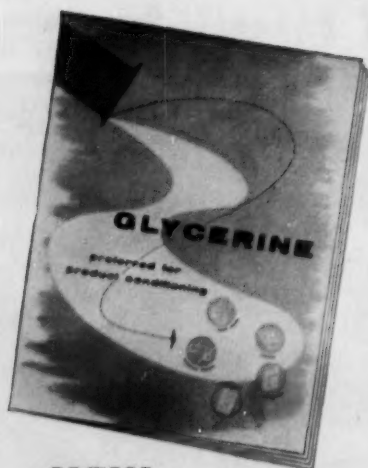
subject to high humidity and heat. Both conditions can affect our products. However, polyethylene has been successful in protecting our products until actually used. The added cost over an unlined container is so small compared with the advantages that it is not even a consideration."

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Flash-Back to Earlier Times

ARAURE, VENEZUELA, a remote village on the tip of a peninsula, is the scene of one of the largest—yet most archaic—"salt from the sea" operations in the Western Hemisphere.

Sea water is allowed to inundate flats, and evaporate. Then native

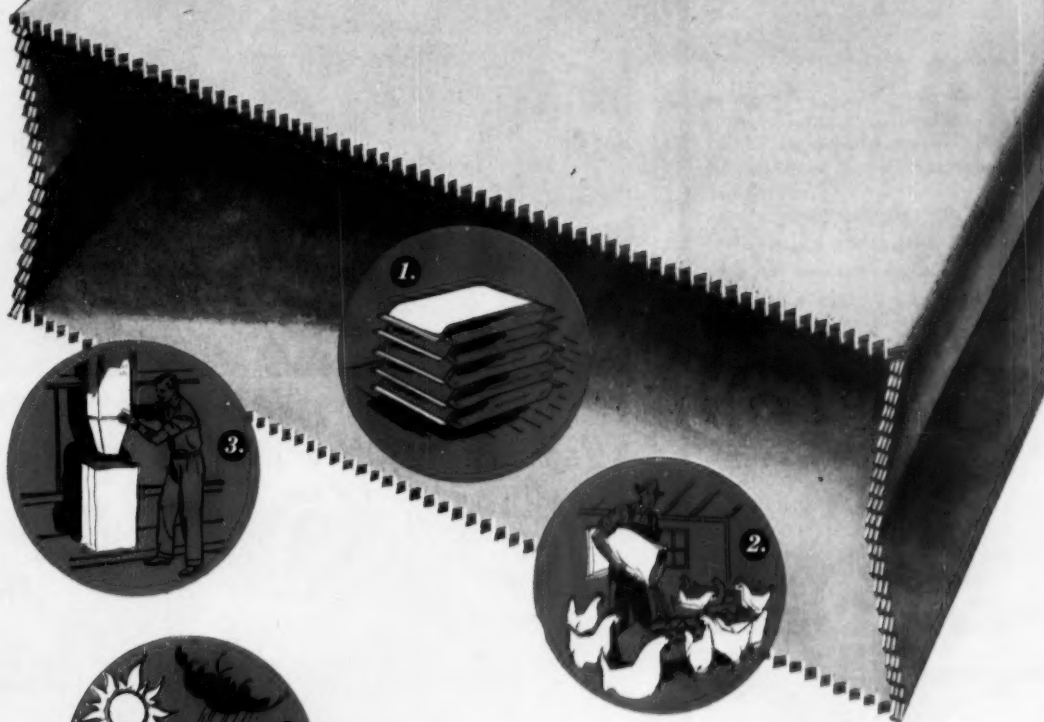
workers (some 400 strong) dig up the crystallized salt, hand-load it into barges, (above), lug it to the salt hills for processing (below).

Working on an around-the-clock schedule, each worker is handed a token worth 15¢ in American money for each basket he brings in.



WIDE WORLD PHOTOS

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FOREIGN.

Ammonium Sulfate/India: The state-owned Sindri fertilizer plants produced 154,121 tons of ammonium sulfate during the first half of 1955—29,496 tons more than during the same period in 1954.

Total production of ammonium sulfate in 1954 was 278,077 tons; production target for 1955: 320,000 tons.

Moreover, a plan to expand Sindri's output through the production of urea and ammonium sulfate-nitrate from coke-oven gas is now under way. This additional capacity is expected on-stream by 1958, will increase the state-owned plants' fertilizer output by 60%.

Starch/India: Corn Products (India) Ltd., in cooperation with Indo-British Parry & Co. and the government of Travancore-Cochin, has submitted a scheme to New Delhi to manufacture starch from tapioca.

Corn Products will hold one-third of the capital interest, but will assume almost complete responsibility for the management of the new industry.

The India-based U.S. firm has been in the starch importing and packaging line for nearly thirty years, but now import restrictions and growing competition has brought business to a virtual standstill.

Cellulose/Brazil: A \$2.7-million (U.S.) loan has been authorized by the Minister of the Treasury (Brazil) to be invested in the development of plants

producing cellulose from sugar cane waste. Brazil officials hope the move will help to diversify the industry.

Spanish-East German Accord: According to reports circulating in Madrid this week, a Spanish firm is finalizing arrangements to import substantial quantities of East German ammonium sulfate via West Germany.

Payment will be made through the Spanish limited-convertibility mark account in West Germany; justification for the deal (according to its promoters) is that West Germany is unable to deliver.

Polyethylene/Great Britain: Bakelite Ltd. has concluded an agreement with Union Carbide Ltd. whereby Bakelite will market polyethylene produced in the United Kingdom by Union Carbide.

Cartels/Japan: A bill that virtually okays the formation of cartels in Japan has been passed by the Japanese Diet lower house's Commerce & Industry Committee. In effect, the bill would amend the existing Export-Import Transaction law, which provides for an official permit system for cartel organization, as follows:

- Authority to approve application for formation of a cartel would be given to the Minister of International Trade and Industry.

- And if the minister failed to approve within 20 days, such inaction would be interpreted as permission to go ahead.

A LITTLE **CHEMICAL DIVERSIFICATION** GOES A LONG WAY

At Stauffer's Niagara Falls plant diversification is a big word — for here following the initial Chlorine-Caustic production is the manufacture of chlorinated solvents, sulphur chlorides, and metal chlorides. This is only one example of a large integrated operation at Stauffer to produce numerous chemicals destined for many and varied uses.

On an even larger scale, Stauffer's 38 plants, coast-to-coast, complement each other in the manufacture of basic chemicals for industry and agriculture. **Stauffer Chemical Company, 380 Madison Avenue, New York 17, N. Y.;** sales offices in principal cities.

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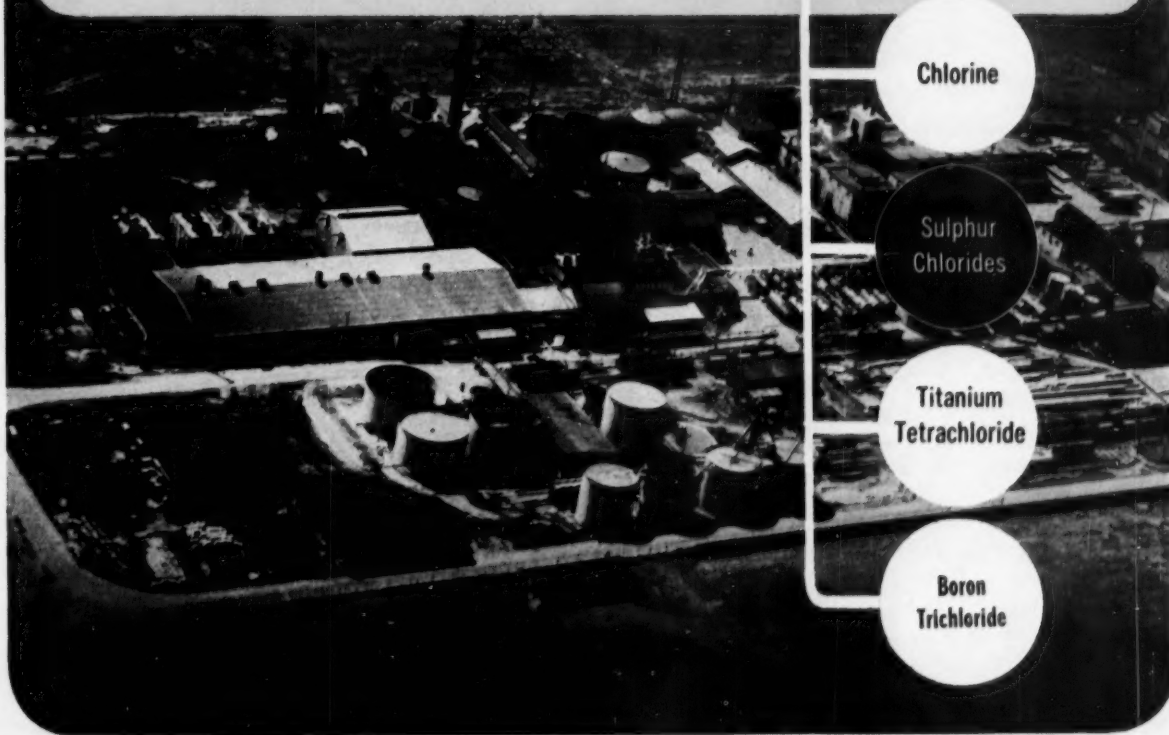
Silicon
Tetrachloride

Chlorine

Sulphur
Chlorides

Titanium
Tetrachloride

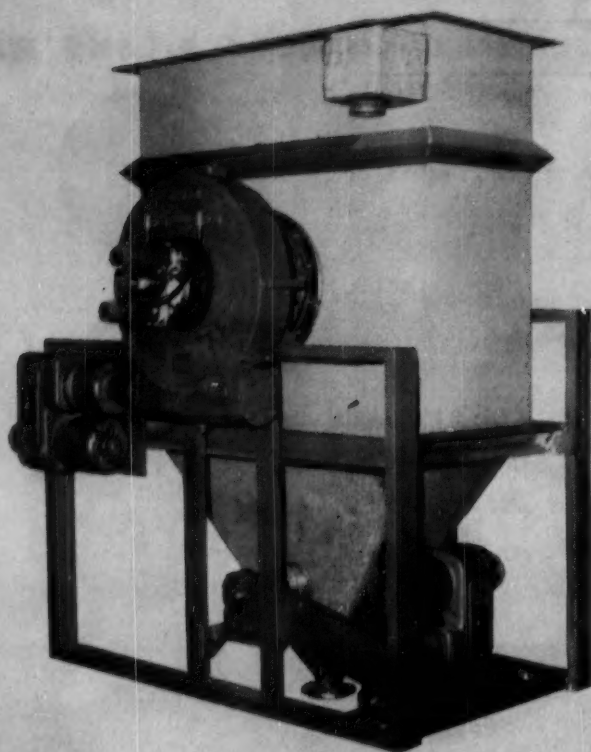
Boron
Trichloride



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Another Eimco Continuous Vacuum Filter

The machine pictured is built as two different machines. One contains a drum type filter with a top feed for drying sand or other crystalline materials. The other contains a disc type thickener filter which runs completely submerged. It is built with a large port for carrying the clarified product or filtrate and a small port arranged to admit a small amount of blow at the bottom sector for dislodging the thickened material so that it can be discharged at the bottom of the tank.

These are special filter applications and examples of developments in liquid-solids separation through filtration.

Eimco, with more than half a century of experience in serving the process industries, makes drum, disc, pan, pressure, plate and frame and tubular type filters with numerous attachments that can be applied to processing industries with difficult filtration problems.

Write for complete information.



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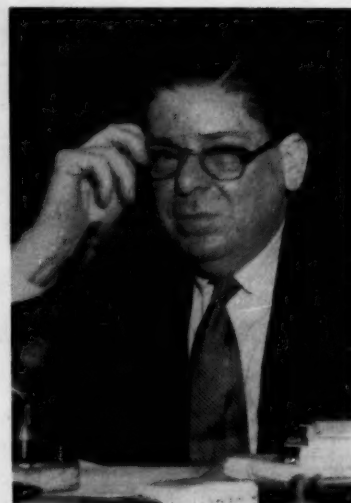
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B & I.



SECRETARY MITCHELL: For industry, \$1 minimum 'not impossible.'

LABOR.

With Difficulty: With an eye on the South, where lower wages are most common (CW, Aug. 6, p. 36), Secretary of Labor James Mitchell is predicting that industry will find the new \$1/hour minimum wage "difficult but not impossible." President Eisenhower is expected to accept Mitchell's recommendation that he sign the \$1/hour bill recently passed by Congress.

More Coming: Work stoppages have been running high in the chemical industry as well as in other fields this summer, and the government is expecting still more trouble in the next few months—particularly at small and medium-size plants. James Finnegan, director of the Federal Mediation & Conciliation Service, thinks labor unions will try to get from small companies wage increases as steep as those being given by large companies.

- In the Florida phosphate strike, American Agricultural Chemical became the second firm (Coronet was first) to get back into production. American Ag signed a two-year contract with International Chemical Workers Union (AFL), providing for an 8½¢/hour package now, 4¢ in '56.

- At New Orleans, American Cyanamid and the Oil, Chemical & Atomic Workers (CIO) appeared to be far apart as the OCAW strike passed the one-week mark. The union demanded 30¢/hour, the company was offering 15¢ or an 8.6% rise.

Q. Could chemical science find a way to increase the heat resistance of polyethylene for greater usefulness?

**A. ELECTRON BOMBARDMENT
GIVES POLYETHYLENE
AMAZING NEW PROPERTIES**

It's called radiation chemistry—this new G-E technique of bombarding plastics with high-energy electrons to create useful new properties.

For example, General Electric is applying it—for the first time—to make polyethylene film suitable for electrical insulation. G-E Irrathene® 201 irradiated polyethylene film has all the excellent insulating properties of conventional polyethylene, but it does

not melt at elevated temperatures.

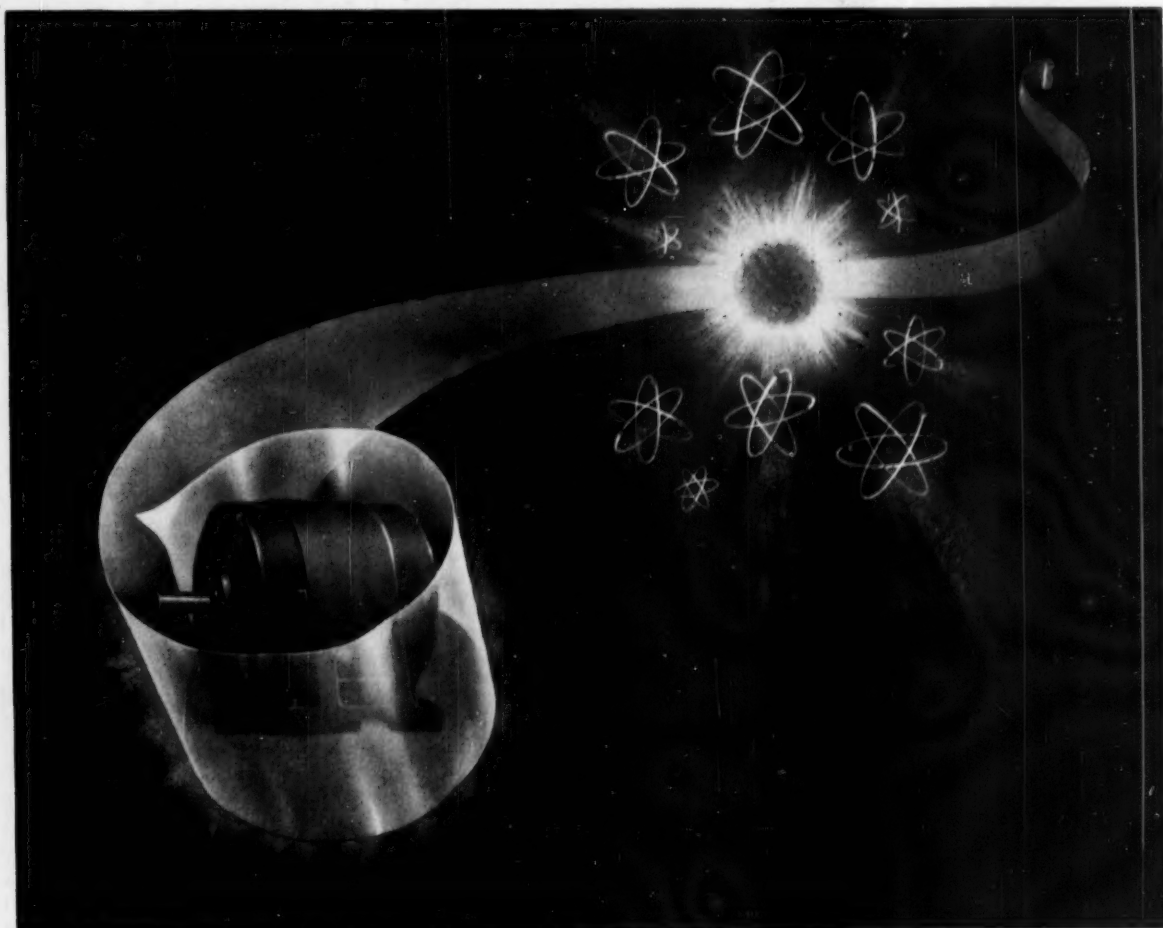
Irrathene holds tremendous promise for industry—not only in the electrical field, but for protective pipe-wrappings, hot-food packaging films . . . anywhere that heat-resistant polyethylene is useful.

You'll be hearing more about radiation chemistry from G.E. It's another example of progress for all—through G-E chemical progress.

Another example of,



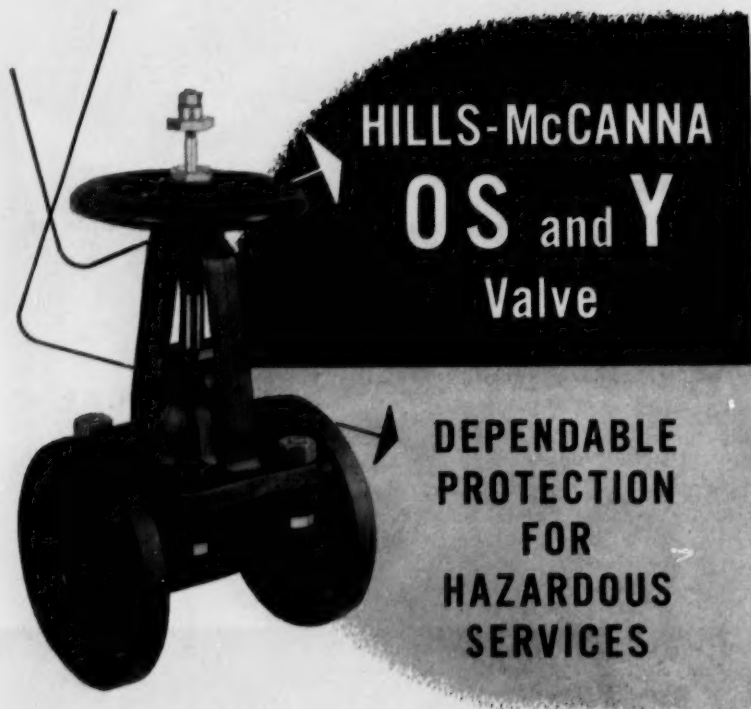
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For new developments in Plastics Compounds, Silicones, Electrical Insulating Materials, Industrial Resins and Varnishes, Plastics Laminating and Molding . . . write for "G-E Chemical Products" booklet (CDG-101) to: **CHEMICAL and METALLURGICAL DIVISION**, General Electric Company, Section 500-5B, Pittsfield, Mass.

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Now you can combine the corrosion resistant characteristics of the Hills-McCanna Saunders principle with the dependable protection of a sealed bonnet and packed stem for handling hazardous or toxic liquids and gases.

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B & I.



ATTORNEY GENERAL BROWN:
In California tax clash, a big demand.

LEGAL

City Says 'No': The ruckus over oil revenues is still buzzing this week out in California, even though the state supreme court ruled last spring that the city of Long Beach—which has been taking in about \$30 million/year in oil royalties (CW, Oct. 9, '54, p. 19)—is entitled to only part of that income and may use this money for harbor improvements only. State Attorney General Edmund Brown—basing his action on that decision—is demanding that Long Beach now hand over to the state treasurer the more than \$100 million that the city has been wanting to spend for public buildings and other civic projects. Long Beach city officials say they'll refuse to pay it. Outcome is of interest to petrochemical and chemical companies using the \$150-million harbor and hoping for a larger industrial market in the vicinity.

Two Firms Cleared: One chemical process company was sued in a big new case last week, but two other firms were exonerated in separate proceedings:

- At Knoxville, Tenn., 150 farmers and other residents of Blount County are suing Aluminum Co. of America for a total of \$2.8 million. They assert that fumes from the nearby Alcoa plant have damaged crops, trees, shrubs and livestock. Alcoa officials decline to comment at this time.

- Testimony that the company continuously monitors its plant exhaust



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At the Petro plant in Tuscola, Illinois an endless stream of natural gas is being separated into ethane, propane, butane, and natural gasoline. The ethane is converted to ethylene, which in turn is converted to ethyl chloride, ethyl alcohol, ether, and polyethylene. U.S.I. ammonia and sulfuric acid plants next door supply and receive raw materials.

If you need one of these chemicals, or one of the many others that Petro could manufacture, why not add this plant to your facilities. Our engineers will be glad to discuss your long-term bulk requirements for chemicals from Petro.

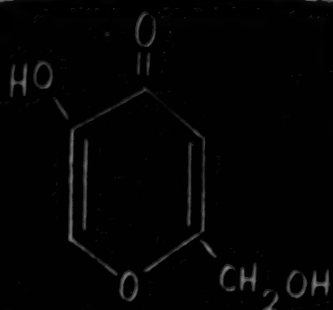
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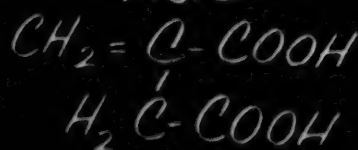
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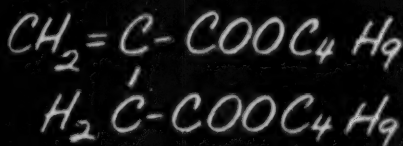
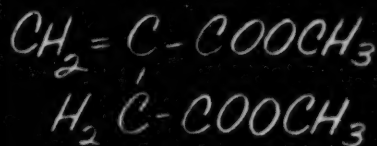
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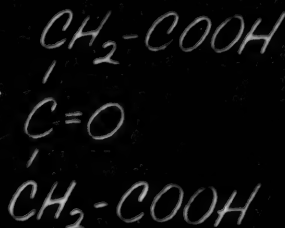
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A. R. MAAS CHEMICAL CO.
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OUR NEW NUMBER: LUDLOW 8-2214

B & I.

fumes for sulfur dioxide content helped win a dismissal for Consolidated Chemical Co. at Houston, Tex. The Harris County Health Unit had charged that plant emissions were "injurious to the public health," but the court ruled that evidence on this point was insufficient.

• Dr. Melville Aston, Philadelphia medical examiner, has cleared Publicker Industries of an accusation of criminal negligence in connection with a six-alarm fire that killed four persons at the firm's alcohol plant last May 26. In the hearing conducted by Aston, investigators testified that the company apparently had observed all fire safety requirements.

KEY CHANGES. . .

W. James Latimore, to assistant sales director, Grasselli Chemicals Dept., Du Pont Co. (Wilmington, Del.).

Richard F. Brown, to vice-president, **John R. Brown, Jr.**, to managing director, Research and Development Division, Spencer Chemical Co. (Kansas City, Mo.).

F. Dean Hildebrandt, to senior vice-president, McKesson & Robbins, Inc. (New York).

Fred L. Shanklin, to vice-president and general manager, Ore Division, Union Carbide and Carbon Corp. (New York).

Cornelius C. Coakley, to director, operations, National Aniline Division, Allied Chemical & Dye Corp. (New York).

William M. Yates, to director, patent department, Dow Chemical Co. (Midland, Mich.).

I. H. Munro, to vice-president, Solvay Process Division, Allied Chemical & Dye Corp. (New York).

K. D. Bowen, to vice-president and general manager, Texas Butadiene & Chemical Corp. (Houston, Tex.).

John G. Bill, to chief executive officer, Sharp & Dohme Division, Merck & Co. (Rahway, N. J.).

D I E D.

William J. Hale, 79, research consultant, Dow Chemical Co. (Midland, Mich.), at Midland.

Corrosioneering News

Quick facts about the services and equipment Pfaudler offers to help you reduce corrosion and processing cost.



Published by The Pfaudler Co., Rochester, N. Y.

New PW drive for agitator speeds from 60 to 340 RPM!

Here is new flexibility for your laboratory and pilot plant operations.

You can tackle a big variety of jobs with a new drive now offered on reactors up to 100 gallons. It is the Pfaudler PW drive—a variable speed drive which can be easily adjusted between 60 and 340 RPM.

The PW drive is standard equipment on all Pfaudler reactors up to 100 gallons. It has constant speed sheaves, which can be arranged to give six different speeds: 60, 90, 120, 175, 250 and 340 RPM.

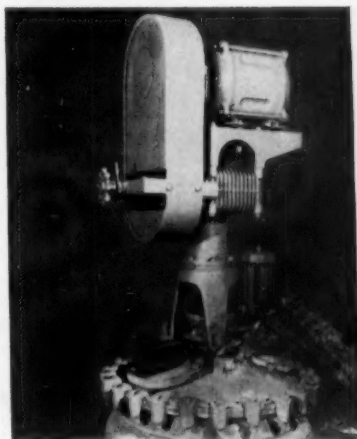
As an alternative, variable pitch sheaves may be supplied to provide quick, precise adjustment of speeds within the range 60 to 300 RPM.

More power, too

In the speed reducer, both the worm and gear are "full-throated" to increase the load carrying capacity of the gears. In brief, "throating" is the construction of gear teeth and worm in arc shapes, which fit together so that there is a larger area of contact per tooth and a greater number of teeth in contact.

As a result of this practice, gears in the standard Pfaudler PW drive are rated to carry up to 3.6 H.P. at 175 RPM, well beyond the capacities normally required in small reactors.

You'll also find it easier to get at the top head, to connect supply lines, because the PW drive is smaller and the motor is mounted above instead of alongside the drive. Part of the



For laboratories and pilot plants, new PW drive is supported high and out of the way, providing better access to top of reactor.

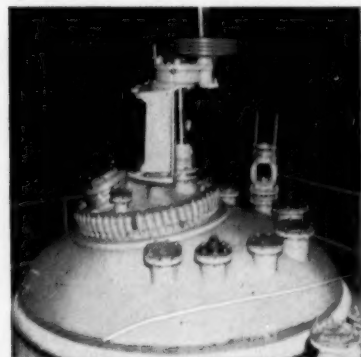
over-all space saving is in the smaller gear housing, another result of throated gear construction.

Still another advantage is the extra quietness of this new drive. Because the gear teeth make contact over an increased area, you get accurate meshing, without distortion.

For more data about this versatile new drive, available on Pfaudler glassed steel, stainless steel or alloy reactors up to 100 gallons, write for Bulletin 923.

Huge reactor sets new record in size

This is a 3,700-gallon glassed steel reactor, built for use as a polymerizer in a Ludwigshafen, Germany, polyvinyl chloride plant.

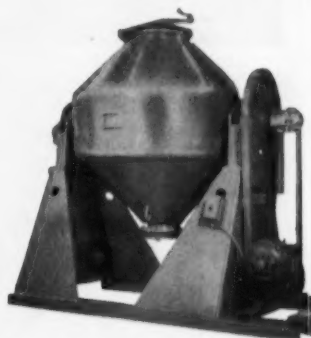


Designed to take internal pressure up to 225 psi, it stands 17'4" high and is the largest high-pressure vessel of this type built by Pfaudler—too large, in fact, to be fabricated in Europe!

It was built at Rochester, N. Y., using the corrosion resistance of glass plus the working strength of steel. This eliminated the extra expense of heavy alloy construction (the top head is 1 7/8" thick), and provided the required protection against metallic contamination and adherence of the product.

Dual rotary seals and extra-rigid Pfaudler VRLH drive were included as measures to maintain sealing under high pressures.

Perhaps you have a similar problem that can be solved by the surprisingly versatile resources at Pfaudler. Write us about it.



Confidential tests, using your own product, will be conducted to get data on performance in this dryer-blender.

Test your product free in Pfaudler dryer-blender!

You can now get valuable information on the drying and blending of your specific product in Pfaudler's glassed steel conical dryer-blender.

A test unit has been made available in the Pfaudler laboratory, for conducting sample runs of products sent in by chemical processors. Free of charge, a product will be tested and a full report made to you or your observers as to the drying results of various processing conditions.

Such test data may be infinitely useful to you in deciding to improve your drying operations. In actual full-scale operation, these glassed steel dryer-blenders have performed in 7 hours, an amount of work formerly requiring 4 days.

Write for further details on our dryer-blender laboratory tests.

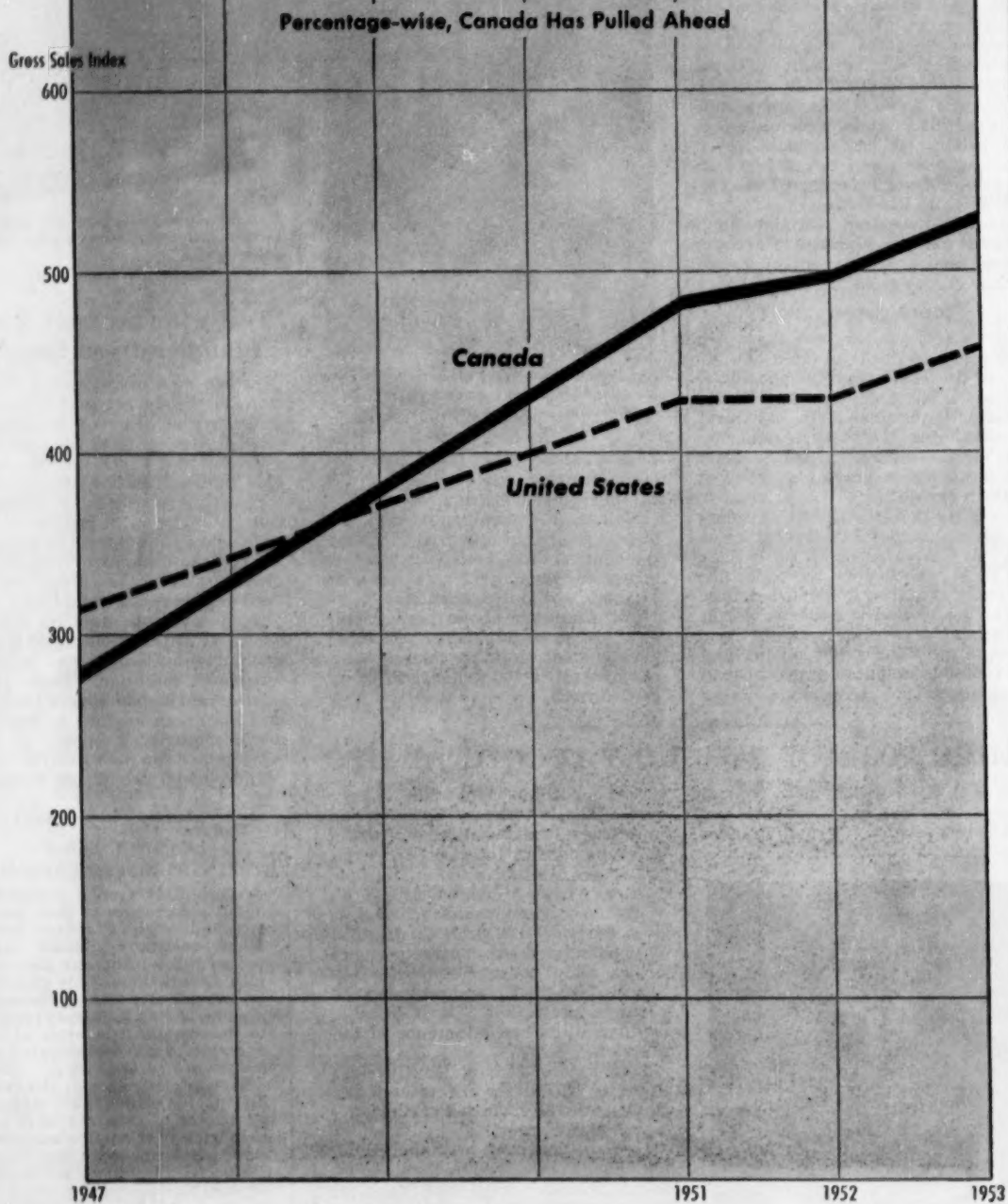
CAN YOU USE A GUARANTEE AGAINST CORROSION?

An actual 12-month guarantee against corrosion is now being supplied with Pfaudler acid-alkali-resistant glassed steel processing equipment for certain applications. This guarantee provides for free on-the-spot repairs, or F.O.B. factory repairs to the vessel if it is rendered inoperable by corrosion during its first year after delivery.

To learn more about the conditions for which this unique guarantee is offered, and to get help with your particular corrosion problem, write to: Dept. CW-9 The Pfaudler Co., Rochester 3, N. Y.

GROWTH OF CANADA'S CHEMICAL INDUSTRY

(Gross Sales 1939=100)



by Charles Graham

Canada Comes of Age

Are you looking for "lebensraum"? Diversification? A way to expand your operations and profits? If so, here is how, why, when and where.

For the chemical manufacturer, Canada has room, resources and ready markets, as well as a need for new technical knowledge.

Here is a country almost a million square miles larger than the continental United States with a population less than one-tenth as great. Popularly considered to be the second wealthiest nation in the world, it had

a net per capita income of \$1,230 in 1954. Mineral deposits in its mountains and beneath its land rival those found anywhere; across its face and within its hollows lie tremendous energy resources; yet with all this,

its gross national product is only roughly \$25 billion/year, the value of its chemical products less than \$1 billion/year.*

Industrially, the Dominion of Canada stands today where the United States stood in the '20s. To tap its resources and help it realize its almost dramatic potential—especially in the chemical field—Canada

*United States, on the other hand, had a net per capita income of \$1,847 in '54, a gross national product of more than \$350 billion/year, and a chemical output valued at over \$20 billion/year.



Meet the Author

CHARLES GRAHAM turns his favorite hobby (writing) to his favorite subject (Canada's chemical potential). It's a subject he knows well.

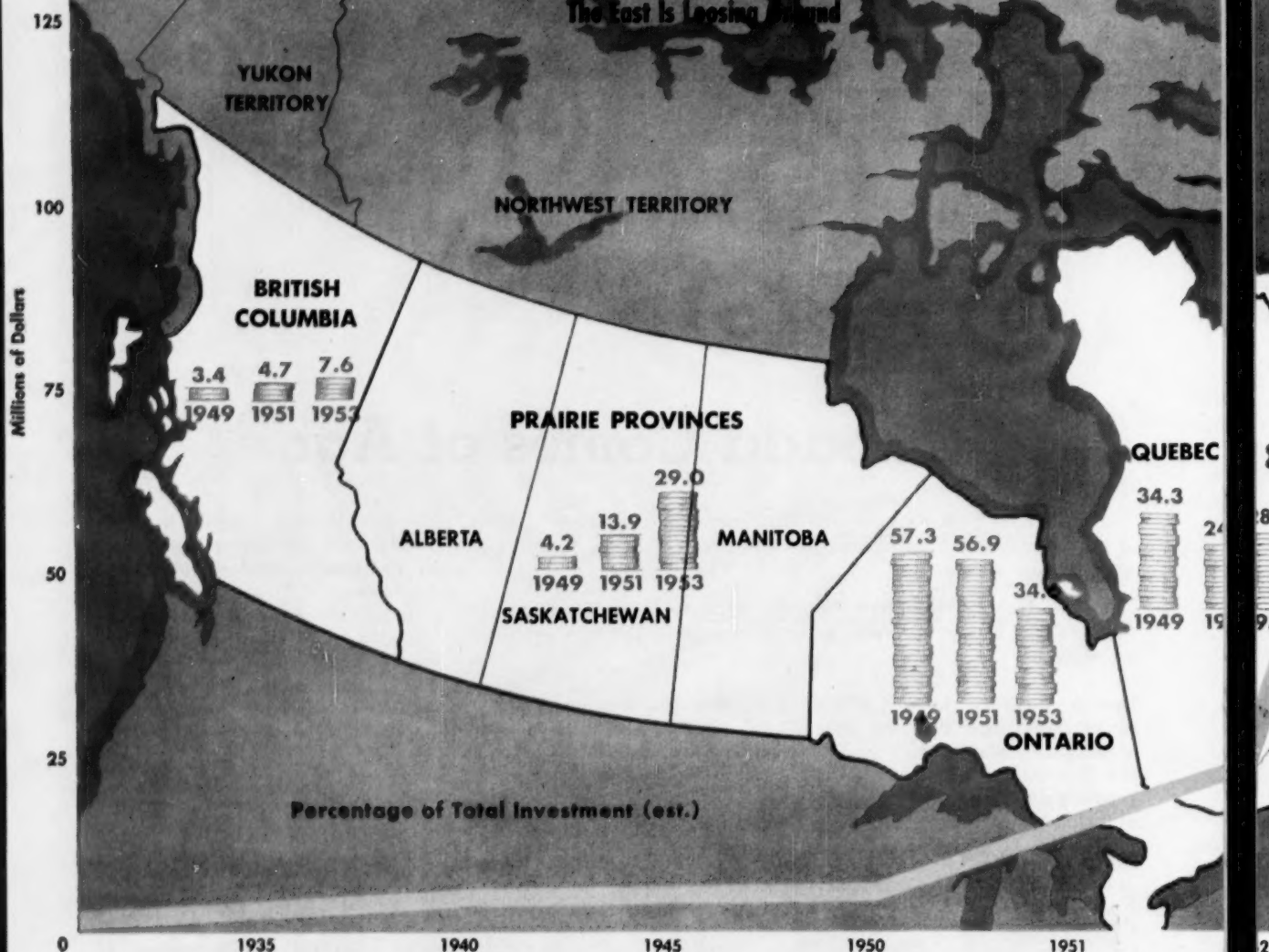
A graduate chemist (Dalhousie University) and economist (McGill and Harvard), he started out as a lab chemist in an explosives plant during World War II, later served as a public relations officer, then as a research officer, in the Canadian army. Out of service, he took a job with CIL, where he worked for five years as a chemical market analyst before moving on to chemical consultant J. T. Donald & Co. Ltd., where he now serves as Director of Economic and Market Research.

He is a member of Econometric Society, American Economic Assn., CMRA, and CCDA as well as publicity chairman of Chemical Institute of Canada's Montreal section.

\$150

NEW CAPITAL INVESTMENT IN CANADIAN CHEMICAL PLANTS

The East Is Losing Ground



C W Report

needs more capital, more technical assistance, and more skilled people. The U.S., to which Canada is already economically tied, is in a position to answer this call to the greatest benefit of both nations.

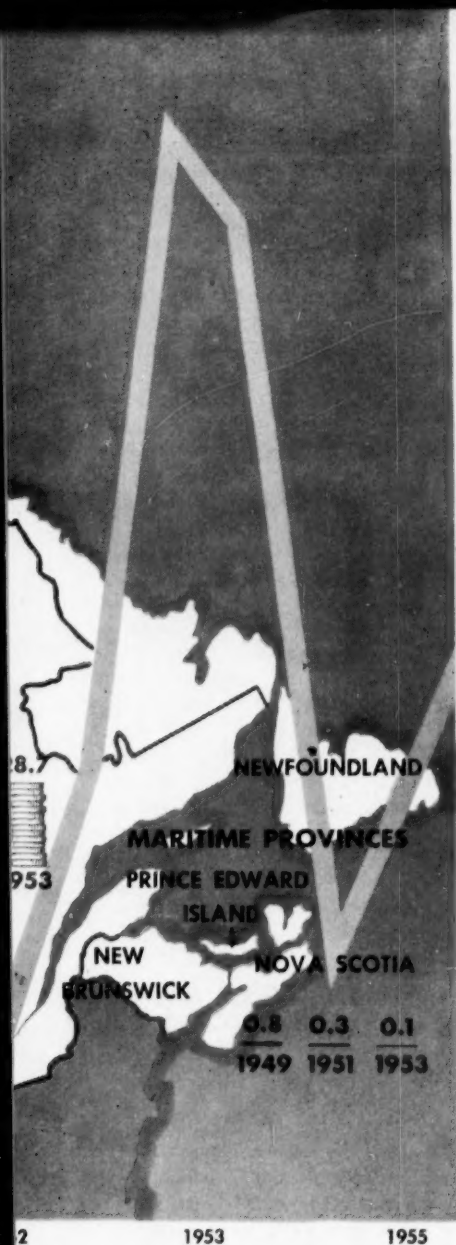
Why U.S.? Pressed by an urge for expansion and with money in its

pocket, U.S. business is looking for a way to grow. Well sold on the idea of expansion through diversification, it has tried its hand at mergers (CW, May 28, p. 14); and the chemical industry in particular has thrived on the diet. Geographical diversification, an equally valid alternate, so far has played a poor second fiddle. But as mergers approach their practical and legal limit, U.S. business will find itself taking another and more searching look at the idea of planting itself in fertile ground.

No new idea, private U.S. investment in Canada today totals almost \$4 billion; and, beginning back in 1877, when interests backed by Lam-

mot du Pont bought the Hamilton Powder Co. and the Windsor Powder Co., the U.S. chemical industry has contributed its share to this total. Following markets and raw material sources to odd corners of the world has long proved a profitable if sometimes risky journey for U.S. investment; but now, for the chemical industry in particular, some economists believe that dollars planted above the 49th parallel in the long run will yield a greater harvest than the same investment made any place else—even in the U.S. itself.

Why Canada? Canada and the United States probably are closer in culture, economic life and prob-



lems, and political philosophy than any other two nations on earth. They are linked by transportation, communication and energy systems, and by the need for a common defense. Their interdependence steadily grows.

In the area of trade, for example, Canada is currently the largest single customer for U.S. exports (about 20%), while the U.S. is Canada's biggest buyer (about 60% of its exports) and takes almost a quarter of its total import needs from its northern neighbor. In 1868, when the Dominion of Canada was just one year old,* the

*The Dominion of Canada was created in 1867 through the union of Upper (British) and Lower (French) Canada, Nova Scotia and New Brunswick.

U.S. sent only 8% of its exports to Canada, bought only 13.5% of its imports therefrom.

But in the time since its birth as a dominion, Canada has developed rapidly. Today, not only the United States but also the rest of the world eats its fish, wears its furs, writes on its paper, extracts power from its uranium, uses its ammonia (and will use its potassium to make fertilizers), turns its titanium ore into fast-flying aircraft, works its iron into steel bridges, and on through its almost limitless resources.

It has been said that the first half of this century belonged to the United States and that the second half belongs to Canada. And like any other adolescent, Canada is in a hurry to take its place among the adult nations of the world, and strives not too patiently for a position of world leadership.

But even for Canada to have reached its present position, it has had to receive a heavy investment of foreign venture capital. In 1950, U.S. interests alone put over \$1 billion into Canadian industries; total foreign investment in Canada amounted to over \$10 billion in 1952. For its continuing growth, Canada will need more outside capital than ever before. The supply of domestic venture capital in Canada is small; and even if it could be tapped more effectively, at least part of Canada's economic growth would still have to be financed for some time to come by foreign capital.

More important from the view of outside investors is the fact that Canada is currently riding a wave of industrial expansion so sound that many economists refuse to call it a "boom." Canada is enlarging her internal markets by leaps and bounds; almost daily, it is baring more and yet more of its natural resources.

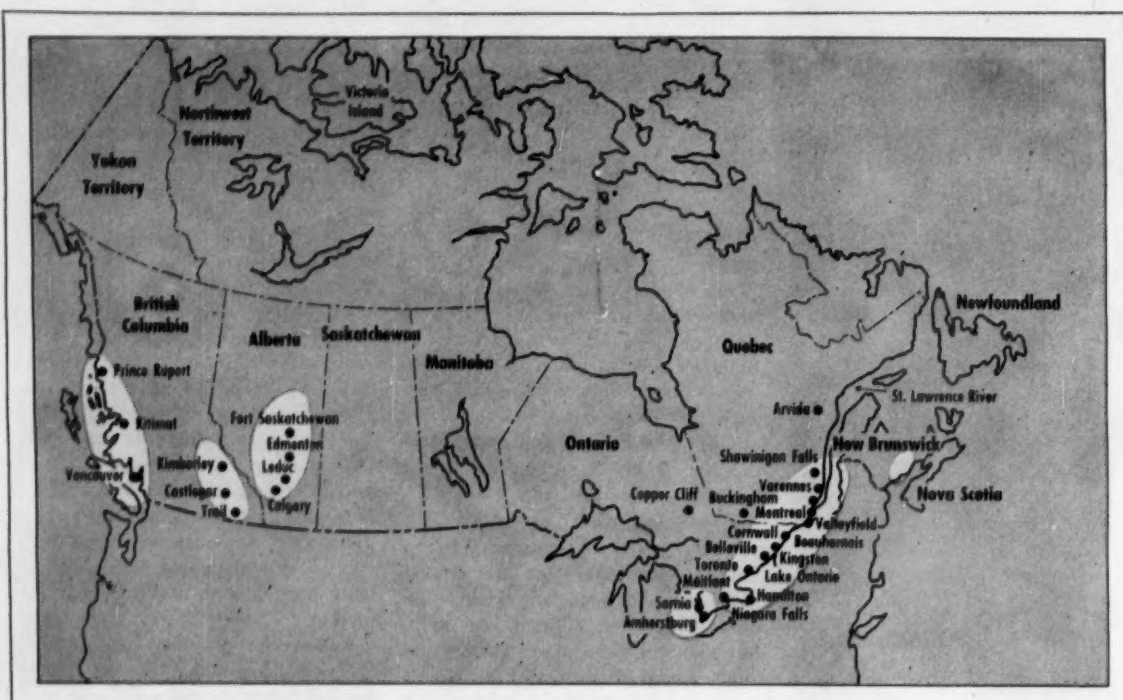
For the U.S. chemical industry, in particular, there is Canada's newly discovered potash, its abundant salt and lime, its reserves of petroleum, natural gas and coal. There are the by-products of its metal smelting and of its pulp and paper manufacture. There is its low-cost power, natural

gas and hydro. And most important, there is its market: more and more chemicals are going to Canadian growth industries whose markets in turn, both domestic and export, are stable and secure. Despite the almost unbeatable record of the U.S. chemical industry in recent years, Canadian chemical sales have actually surpassed those of the U.S. on a percentage basis over the last few years (see *chart: Growth of Canada's Chemical Industry*). But if these are the markings of its sound expansion, they are also the reasons for Canada's call for help: the greater the expansion, the more imperative is the need for foreign capital and technical know-how to work the resources and to supply the market.

Yellow for Caution: Many U.S. chemical companies have already heeded Canada's call and discovered the rich rewards of doing business north of the border. A few who answered found that for them the distant yellow glitter meant caution and not gold. But for the most part, U.S. chemical manufacturers have not yet bothered to investigate thoroughly the opportunities in Canada, are only now beginning to appreciate the economic significance of these opportunities.

For every success, of course, there are often failures; and Canada is no exception. By exercising care, many failures can be avoided; enthusiasm must be tempered with judgment based on detailed knowledge—not always an easy lesson to remember, it can prove a costly one to forget. Particularly when an expansion opportunity seems most obvious, it is essential that a company look twice and then move only with the utmost caution.

Red for Stop: In trying to seize an obvious opportunity, of course, a firm courts company and trouble. When a Canadian market grows big enough to justify a plant of economic size, firms both domestic and foreign start jockeying for position. Often, two or more companies start off simultaneously; sometimes, that creates problems. Today, for example, there are two Canadian plants making ethylene glycol, each capable of supplying substantially the entire current Canadian



Canada's Chemical Profile

Canada is continually loosening its chemical belt, bringing a new plant onstream, moving off in a different geographical direction. But withal, there are particular areas (circled on above map) that stand out with respect to growth potential and, consequently, interest for prospective investors. Here is a brief run-down on some of them:

Area 1: Coastal British Columbia is in a perfect location for export, has as well a major concentration of the chemical-consuming pulp and paper industries. Moreover, cheap hydroelectric power should be available soon from new Western power developments.

Area 2: Trail and Kimberley, B.C., are the sites of heavy-volume fertilizer production by plants of the Consolidated Mining and Smelting Co. of Canada. Combined output of Cominco's plants accounts for a large share of Canada's total chemical production.

Area 3: Alberta is fast developing as Canada's leading petroleum and natural gas center. An extremely cheap energy source, natural gas (together with petroleum) serves also as a source of raw materials and as a consumer chemical.

Near the center of this region lies Edmonton, the site of CIL's new polyethylene plant. And in nearby Fort Saskatchewan, Sherritt-Gordon's large ammonia plant is turning out material for the chemical refining of base metal ores while a sulfuric acid plant is going up to provide acid for the refining operation and for the production of alum and ammonium sulfate.

Area 4: Sarnia, Ont., called "Canada's Chemical

Valley," has the largest petroleum refineries in the country, the major chemical plant of Dow Chemical of Canada, and Polymer Corp.'s synthetic rubber plant. Between 5-10% of Canada's chemical output originates in this region (CW, July 11, '53, p.26).

Area 5: St. Lawrence Valley-Lake Ontario region (Montreal-Toronto vicinity) has the heaviest concentration of population and industry in the Dominion. Within this area is located most of the country's major chemical production: at Shawinigan Falls, for example, carbide, acetylene, acetone, acetaldehyde, acetic acid, vinyl acetate, caustic soda, chlorinated solvents, and cellophane are produced; in Montreal East there is output of ethylene glycol, phenol, acetone, and isopropanol; across the river in Varennes are plants for making phosphorus, phosphates, formaldehyde, and pentaerythritol; from Beauharnois, Valleyfield and Cornwall come caustic soda, chlorine, and acids; from Maitland, nylon intermediates; and from Kingston and Millhaven come finished nylon and Terylene (Dacron).

For most producers planning to make chemicals for domestic consumption, this region is the most logical place to locate. Completion of the St. Lawrence Seaway will mean more power and better transportation of raw materials and finished goods.

Area 6: New Brunswick is showing signs of an awakening economy. Recent mineral discoveries have added to the province's base metal wealth. For prospective investors, New Brunswick is worth watching—but strictly for the future.

market.* There is a similar situation in formaldehyde, except that there are three competing plants having a combined capacity triple today's total market.

In the lure of newly discovered resources there is a second, equally deceptive obstruction to be reckoned with: the sometimes slow, but always essential, predevelopment of markets. With the uncovering of promising raw-material deposits, some firms quickly sense what seems to be an outstanding opportunity for development (both of themselves and of the raw materials); to their later regret, rush to set up plants before sizable markets are in sight. Sometimes, even a firm going into production with its eyes wide open to the likely difficulties of the first few years faces greater hardships than it had counted on:

Canadian Chemical Co., for example, \$60-million affiliate of Celanese Corp. of America, is currently riding out a rough financial storm blown up by underdeveloped markets. In 1953, its parent, Canadian Chemical and Cellulose Co., reported: "A good start has been made in developing markets for the company's (Canadian Chemical) products (cellulose acetate, formaldehyde, methanol, pentaerythritol, and other natural gas-based compounds), though the general conditions of the market, particularly in the textile field, have precluded the results we had hoped for in 1953 and indicate a major problem of merchandising for 1954 . . . The operations at Prince Rupert (a pulp mill also controlled by the parent company) resulted in a profit that, however, was not sufficient to offset the loss on the first few months of chemical and textile operations at Edmonton. The Edmonton results were not unexpected . . ." Consolidated net loss for 1953: over \$1.2 million. Consolidated net loss for 1954: \$5.2 million.

Now, two years later, Canadian

*One of these plants, in Montreal East, is presently out of operation while being converted to a new process.

Chemical Co. is still building markets for the future, still trying to work its way out from under its initial handicap. No firm with lesser financial resources could do the same and hope to succeed; no lesser firm should try. But the moral here is not that U.S. chemical companies must completely bypass the obvious opportunities for expansion in the North; rather, they must pay particular care to the manner and timing of their approach.

Green for Go: The time for expansion into Canada is now. The general economic climate is good. In recent recessions, Canada suffered relatively less decline in production than the United States. Too, economic swings are less extreme than those in the U.S., due perhaps to the fairly conservative attitude of Canadian businessmen. And chemical expansion in Canada, say these same conservative businessmen, is still on the books.

This year, chemical companies expect to invest about \$65 million in Canada. If realized, this will mean more investment than in any year except 1952 and 1953, and certainly indicates no lack of confidence on the part of chemical investors. Never over

\$10 million/year before World War II, new investment in the chemical industry oscillated between \$20 and \$60 million/year from 1946 to 1951. In 1952, it soared to \$141 million; in 1953, it was still tremendous at \$127.5 million. Then, expenditures dropped to \$40 million in 1954, and the cry went out that the Canadian chemical boom was over. It wasn't, of course. The huge expansion of the two Korean crisis years had merely interrupted the normal postwar rate of expansion.

On the other hand, for the individual chemical company, there are other developments that must be taken into account. Action on the Trans-Canada natural gas pipeline, for example, has been postponed for one year—this should bring natural gas to Winnipeg in 1957, to Montreal in 1958. St. Lawrence Seaway facilities—both transport and power—won't be ready until 1959.

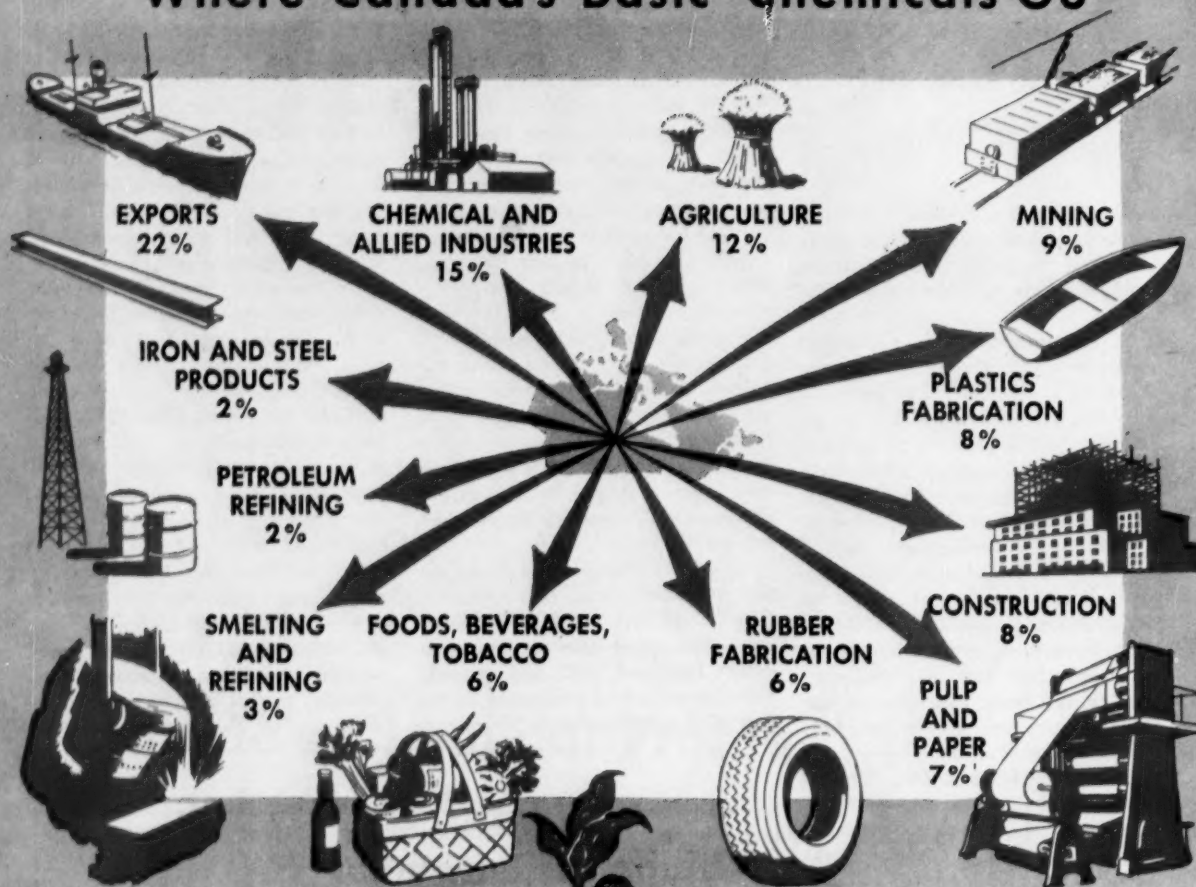
And for those chemical companies now selling in Canada, the question of when to begin production in Canada hinges on market size and raw-material availability. As soon as the Canadian market gets big enough to justify a plant of economic size, and

Things to Remember . . .

Here are a few DO's and DON'Ts for those planning to enter Canada's chemical industry:

- **Don't** assume that the Canadian market for your product is a simple fraction of your U.S. market. It probably isn't.
- **Do** make a thorough market study of the possibilities for your proposed product before even considering a Canadian operation.
- **Don't** overload your Canadian operation with U.S. personnel.
- **Do** use Canadians to the greatest possible extent—for their knowledge of local situations, for their admitted technical and management skills, for the goodwill it will bring you and your firm.
- **Don't** keep too tight a rein on your Canadian operation once it is running. It will have problems far different from those of a branch plant in your own country.
- **Do** make a detailed investigation of local taxation, water supply, antipollution ordinances, and transportation conditions before picking a specific plant site.
- **Don't** build a plant without having a Canadian construction firm at least act as a consultant. They know the climate and the things you might forget or overlook.

Where Canada's Basic* Chemicals Go



* Acids, Alkalis, salts, fertilizers, primary plastics, compressed gases, coal tar distillation products, and miscellaneous chemicals (includes explosives, insecticides, and hardwood distillation products).

C W Report

raw materials permit manufacture as cheaply as in the United States, it is time to build. Otherwise, another firm may get there first and block off all entries—even imports. As soon as a Canadian producer shows he can supply a reasonable portion of the domestic market, he can apply for tariff protection; and after a waiting period of only three weeks, the tariff rate automatically jumps to 20% ad valorem.

A delicate problem, the matter of

timing requires deftness, speed, and detailed knowledge. Canadian markets are quickly won or quickly lost. Witness: the U.S. producers of carboxymethylcellulose, who didn't move fast enough, lost their Canadian market to Chemical Developments of Canada and Canadian Industries Ltd. On the other side, Ethyl Corp. has slated a tetraethyl lead plant for Sarnia; capable of supplying Canada's entire needs, the plant could capture the total tetraethyl lead market.

Picking the Spot: Where to build in Canada boils down to relative raw-material and power costs in different areas, location of markets, and charges for transportation. But each of these factors has ramifications often unlooked for by the unfamiliar eye. For the prospective U.S. investor, for example, the Canadian railway

freight-rate structure merits close scrutiny, differs in many ways from that south of the border.

Beyond that, choosing a plant site in Canada is simply a matter of balancing what you find against what you want; and Canada has a great deal to offer the careful accountant.

In the Central region, there is the Dominion's economic heartland, the provinces of Ontario and Quebec. Between them, they hold 62% of the population, 67% of the production. As late as 1949, they accounted for 85% of the country's total output of chemical and allied products. But today, still growing, the two provinces are diminishing in importance relative to other sections of Canada.

Almost imperceptibly, Canada's industrial belt is shifting as a result of recent raw-material discoveries (see

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table: New Capital Investment in Canadian Chemical Plants). These discoveries range from coast to coast and far into the North away from centers of population, but the major focus of interest is the eight-year-old petroleum development in the West. It's turned the prairies into vast reservoirs; and industry has taken root in the wheat fields. No longer dependent on a one-crop economy, the West is supplying an increasing percentage of Canadian petroleum needs. With the completion of the Trans-Canada gas pipeline to the East, it will send its heat and energy across the land.

Manitoba, always the most populous and industrialized of the prairie provinces, is finding new directions for growth. Saskatchewan soon starts a

new chemical industry based on its vast potash stores. But it is Alberta that has been particularly well nourished by the petroleum boom. The cheapness of natural gas for high-energy process requirements undoubtedly was a deciding factor in CIL's decision to build a polyethylene plant at Edmonton, Alberta, and in Canadian Chemical & Cellulose Co.'s decision to build a cellulose acetate plant, also at Edmonton, and so on down the line.

Farther west, in British Columbia, the effects of the boom are somewhat diminished by the availability of low-cost chemicals from the nearby U.S. Pacific Northwest. Caustic soda, chlorine, salt cake, soda ash and other bulk chemicals move up the coast by barge, are landed at B.C. ports for little more than their Tacoma or Seattle price. Used for the most part in producing goods that are later exported from Canada, they enter virtually duty-free. Thus, to compete, chemical plants in British Columbia must be particularly well located and extremely efficient, and must have low-cost power that as yet can be found only in very few

areas of the Pacific province.

Further chemical growth of the Canadian West will pivot on this low-cost energy. As for its value as a raw-material source, the prairie petroleum boom is relatively insignificant. Most raw materials that can be obtained from Western natural gas can also be taken from Eastern petroleum refinery streams. Moreover, there are few major chemical markets in western Canada as yet, and most products must move to Ontario and Quebec for sale.

Over the years, of course, as other industry takes hold in the prairies and the population there fattens on its labor requirements, a much broader market for products of the chemical industry will arise within the area. But for the present, most chemical companies are locating near established customers, and these customers are largely still in eastern Canada. Thus, Western plant sites are suitable only for those operations in which the largest bulk of sales can come from export—such as fertilizer—or where the product can pay its way over a long haul east—such as synthetic resins.

Canada's Chemical Imports

(Canadian dollars, thousands)

Some High-Priced Incentives for Domestic Manufacture

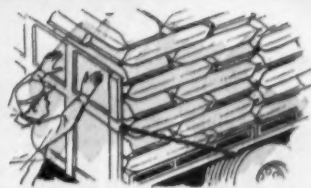
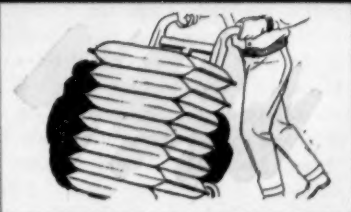
Source: The Canada Year Book 1954

	1949	1950	1951	1952
Acids	4,134	5,614	7,541	5,939
Alcohols, Industrial	602	880	1,228	1,109
Cellulose products	5,654	6,234	7,227	2,555
Drugs, medicinal and pharmaceutical products	14,829	18,629	22,427	21,780
Dyeing and tanning materials	10,294	12,908	13,759	10,023
Explosives	1,910	1,386	1,653	2,247
Fertilizers	7,768	8,792	10,235	10,465
Paints, pigments and varnishes	13,866	18,212	20,861	17,214
Inorganic chemicals, n.o.p. (not otherwise provided for)				
Ammonia and its compounds	260	818	647	1,042
Compounds of antimony, arsenic, tin, copper and zinc	265	284	293	1,085
Soda and sodium compounds, n.o.p.	8,396	9,155	11,498	9,444

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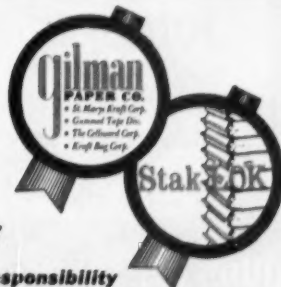


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Among the remaining regions of Canada, there are many areas that, if not meriting prolonged scrutiny, should at least not be overlooked. In the East, for example, there are the Maritime Provinces: New Brunswick, Nova Scotia, Prince Edward Island, and Newfoundland. At present, there is almost no chemical industry in the area, and no tendency to locate one there. But recent mineral discoveries might possibly justify some large chemical operations here while providing the presently depressed Maritime coal industry with a needed shot in the arm and the whole region with a new potential for growth. At the same time, a chemical company locating in the region could find a profitable market in the important Maritime pulp and paper industry.

Picking a Product: The question of what to make in Canada can only be answered by a hard-slogging market survey and manufacturing cost estimate. The answer will depend on what operations the company is already familiar with (i.e., products the company has made or is now making), on what items can be sold profitably in Canada, and on what compounds can be produced at a low enough cost from Canadian raw materials and energy resources.

In general, the ventures with the greatest growth potential will continue to be those that export their output or sell to the important export industries (see table: Where Canada's Basic Chemicals Go). Canadian chemical companies formed to supply this export demand will reap the full benefit of a sizable and ever-expanding world market. Every year, Canada exports approximately 25% of its total national output, about 22% of its basic chemical production—a large part of which are the chemical fertilizers.

This is not meant to dissuade potential investors from trying to capitalize on the still sizable demands of Canada's domestic industries. Witness the fact that Canada imports approxi-

mately \$200 million worth of chemical and allied products a year. In general, these imports go to supply demands not filled by the Canadian chemical industry; even discounting those imports that later find their way into export channels and those that can't be economically produced in Canada, this means there is still a healthy domestic market to which an enterprising chemical company can aspire (see table: Canada's Chemical Imports).

How To: The quickest entrée to Canada for a foreign producer is through the offer of technology for a new plant. No slouch in the development of chemical processes and technology, the Canadian chemical industry nevertheless depends very heavily on imported know-how in its operations. Last year, it is estimated, less than 30% of Canada's basic chemical output came by way of techniques originated in Canada.

The easiest way for a U.S. firm to get an interest in the Dominion is perhaps through licensing of patents and supplying of technical information on a royalty basis to a Canadian firm. Some U.S. companies have done this, and later discovered that while it offers the easiest approach, it also provides the foreign firm with the least operational control.

Another method of U.S. participation in the Canadian chemical industry is becoming more popular all the time. It is sometimes referred to as the "hire-purchase plan": U.S. manufacturer or, in some cases, a chemical construction firm uses its technology to build and operate a plant for a Canadian client. After some specified period, the plant reverts to the client's ownership, and the U.S. concern is paid either a guaranteed sum or royalties.

It is also possible, of course, for a U.S. firm to purchase outright an existing Canadian chemical company. This approach demands careful and sometimes prolonged searching. Many of the larger and more successful Canadian chemical companies are owned by interests, both domestic and foreign, who have no desire in the first place to sell. Of the other Canadian chemical firms, the majority are very small, some are struggling to stay alive, a number have a terrific future, some are available, a few are tightly held. Without the benefit of expert

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50%	218.1 F.	251.1 F.	282.8 F.
90%	218.7 F.	251.9 F.	283.5 F.
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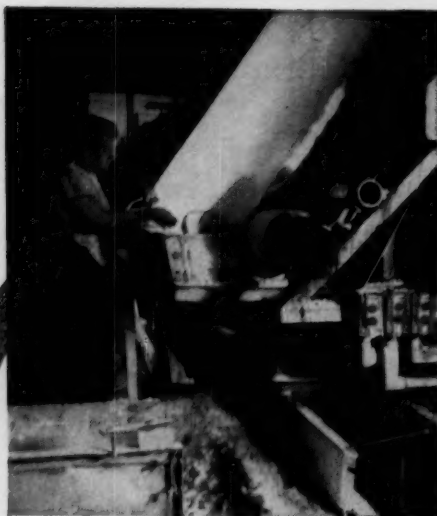
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Canadian advice, a U.S. firm would need a very clear crystal ball to choose the best Canadian base for its operations.

Entering the Canadian chemical industry by tying in with a British or European-owned Canadian operation, of course, is risky. The fall of the old CIL titan under the axe of the U.S. Supreme Court spelled the end of such joint operations for U.S. chemical companies. But U.S. anti-trust authorities apparently have no objection to joint U.S.-Canadian operations in Canada. As proof of this, there stand, among others: Cornwall Chemicals Ltd. (carbon bisulfide), owned by CIL and Stauffer; Chemical Developments of Canada (nonionic detergents and carboxymethylcellulose), offshoot of Dominion Tar & Chemical and General Aniline & Film; St. Maurice Chemicals (formaldehyde, pentaerythritol) owned by Shawinigan Chemicals and Heyden. In some instances, control is divided 50-50; in others, 51-49 with the controller sometimes the Canadian parent and other times the U.S.

Over-all ownership of the Canadian chemical industry shows this pattern: in 1919, the only analysis ever published showed that 32.5% of the industry was owned by Canadian interests, 23% by British interests, and 44% by U.S. investors, with only 0.5% owned by others. Since then, the best estimate that can be made indicates that the pendulum swung toward domestic ownership in 1937, and back again in 1952.

Going It Alone: There are obvious advantages, of course, to entering the Canadian market through joint operation with an established Canadian chemical firm. Nevertheless many U.S. firms have gone into Canada on their own. To name a few: Dow, Mallinckrodt, Merck, Monsanto, Reichhold, and Rohm & Haas. In most cases the Canadian offshoots are wholly owned subsidiaries of their U.S. parents.

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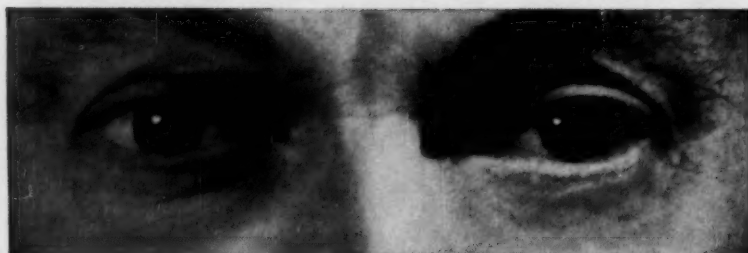
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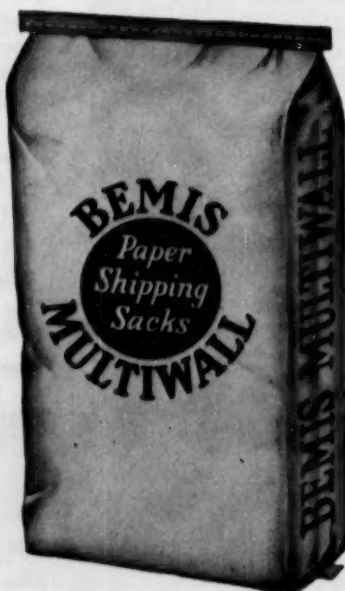
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those companies planning to enter Canada on their own: Should a company try to finance its Canadian operation completely by itself, or should it look to the Canadian money market for part of its capital funds? Canadian investment capital can be found, but it may prove an arduous search.

On the whole, Canadians are less venturesome than Americans. They save their money, and place their savings in insurance and bank deposits. This leaves the institutional investors, principally the banks and the life insurance companies. The Canadian banks hesitate to grant speculative credit; and the life insurance companies are not allowed to invest in new enterprises except to a very restricted degree. Consequently, venture capital is hard to come by.

At the same time, it isn't impossible. Canadian Chemical Co. obtained 10% of its very substantial capital requirement in the Canadian money market. Dominion Tar & Chemical Co.—and, more recently, Midland Chemicals — successfully floated stock and debenture issues.

Canadians may be slow to speculate, but they're quick to see that new productivity is the lifeblood of progress. They may stem the flow, but aren't so cautious that they'll stand by and see it stopped altogether. As they are well aware, it is this progress that has nourished Canada to its present stature and promises to make it the giant of the new half-century.

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Diethyl hydrogen phosphite
Dibutyl hydrogen phosphite
Bis(2-ethylhexyl)
hydrogen phosphite
Triethyl phosphite†
Triisopropyl phosphite†
Tributyl phosphite†
Trihexyl phosphite†
Triisooctyl phosphite†
Tris(2-ethylhexyl) phosphite†
Tris(2-chloroethyl) phosphite
2-ethylhexyl
octylphenyl phosphite
Tricresyl phosphite
Diethyl ethylphosphonate
Dibutyl butylphosphonate
Bis(2-ethylhexyl)
2-ethylhexylphosphonate
0,0,0-Triethyl phosphorothioate
0,0,0-Tributyl phosphorothioate
0,0,0-Triisooctyl phosphorothioate
and other organophosphorus com-
pounds and phosphatic specialties.

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RESEARCH



ATOMIC RESEARCHERS: Few in number, much in demand, they point up . . .

Industry's Number 1 Nuclear Problem

Accelerating nuclear activity in the chemical industry is posing a heavy demand for researchers competent in the new field.

Two paths are open to chemical firms: recruit young people who have been trained in nuclear technology; send a part of your present research staff to receive necessary training.

The problem: student enrolment in sciences and engineering is insufficient to satisfy the swelling total demand for researchers.

A familiar bugaboo, the technical-manpower scarcity, is looming in the path of the chemical industry's swaddling nuclear research plans. At this moment, the problem is not acute, since relatively few companies are actively engaged in anything more than a cursory flirtation with radioactivity in any form.

But with the rapidly approaching advent of nuclear power generation,*

*Five groups now have power-reactor applications before AEC: Nuclear Power Associates; Consumers Public Power District of Nebraska; Detroit Edison; Yankee Power; Consolidated Edison Co. of New York.

and the imminent birth of many now-embryonic radioactivity-utilizing research programs, the problem is expected to assume major proportions.

It's estimated by the Atomic Energy Commission that atomic energy work in the U.S. will require 5,000 new engineers/year for the next four or five years.

How many chemists and physicists and other scientists will be needed is problematical. But it's certain that the demand will be sizable.

These researchers will not be probing the atom in search of fundamental

knowledge about the nature of matter. Instead, they will be concerned with the practical application of this knowledge for gainful purposes. It is more accurate to think of such researchers as chemists, physicists, engineers, etc., specializing in nuclear energy problems.

They will be concerned with such problems as recovery of fuels and radioactive materials from power reactors; devising processes of preparing fuels and separating gross fission products; developing processes of harnessing radiation in synthesis (of plastics, etc.).

Chemical firms, and industry in general, will follow two paths in filling these manpower needs: secure new people trained for work in nuclear studies; send researchers already on the payroll for a nuclear education at any one of several colleges, universities, or government schools.

A recent informal survey by AEC reveals that industry hopes to secure

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Bulletin I-17—"NACCONATES" contains 24 pages of fundamental data on diisocyanates as a class, including 12-pages covering 27 principal generic reactions (with amines, hydrazines, alcohols, carboxylic acids, etc.); 8 pages of suggested uses plus a bibliography of 132 literature references applying thereto. Literally, it is a condensed, timely textbook for research and product development men.

Bulletin I-17A—NACCONATE 80 Four pages of specific data on National Aniline's mixture of approximately 80% of 2,4-tolyene diisocyanate and 20% of 2,6-tolyene diisocyanate. This bulletin includes properties, suggested uses, physiological data and a significant infrared spectogram on NACCONATE 80.

Bulletin I-17B—NACCONATE 65 includes data on National's mixture of approximately 65% of 2,4-tolyene diisocyanate and 35% of 2,6-tolyene diisocyanate.

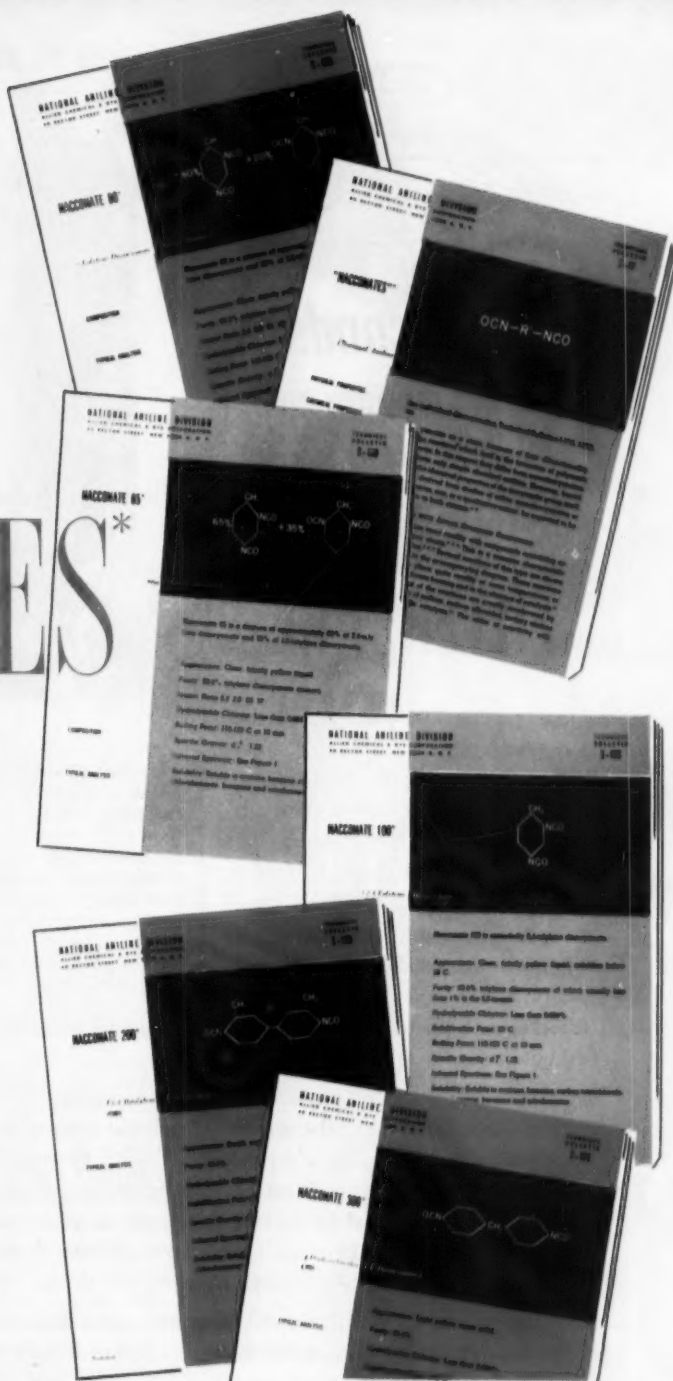
Bulletin I-17C—NACCONATE 100 gives corresponding product data on National's 2,4-tolyene diisocyanate.

Bulletin I-17D—NACCONATE 200 covers National's 3,3'-bitolyene 4,4'-diisocyanate.

Bulletin I-17E—NACCONATE 300 covers National's diphenylmethane 4,4'-diisocyanate.

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This unretouched photograph of a section through an actual Dicalite filtercake shows the even dispersion of unwanted impurities throughout the cake and how easily the clean pre-coat peels from the screen or cloth. Inset shows surface magnified 75 times.



DICALITE DIVISION: GREAT LAKES CARBON CORPORATION, 612 S. FLOWER ST., LOS ANGELES 17, CALIFORNIA

RESEARCH

about half its total need for researchers by each alternative.

Premium on Speed: As things now stand, researchers may obtain nuclear training in a number of ways.

- Schools at Oak Ridge and Argonne National Laboratory offer limited opportunity to industry, are filled largely by personnel of government and firms that are government contractors. The Oak Ridge School of Reactor Technology (ORSORT) emphasizes physics, accepts about 80 students each September for a year of study. The Argonne School of Nuclear Science and Engineering stresses technology, takes 40 for a 7-month course.

- A program of on-the-job training, also provided by AEC, is more freely available to industrial people. Trainees go to work in AEC installations, are assigned to regular projects and given access to classified information bearing on their jobs. At the end of a year, they go back to their companies. Industry study groups, usually composed of several firms, represent another opportunity for similar training.

- Short courses, of 1 to 3 months' duration, are being instituted at a number of colleges and universities. North Carolina State College's 1-month course, a pioneering effort in this direction, manages to do justice to: reactor calculations and design principles; chemical systems for reactors; chemical principles in nuclear processes; hazards and safety considerations; reactor metallurgy; reactor operation; trends and perspectives in nuclear developments.

Fast surveys on this order are most in demand. AEC found that companies expect to train three times as many people this way as by courses of longer duration or on-the-job training. Short courses should be initiated at the University of Michigan and Pennsylvania State University in the not-too-distant future.

- A more ambitious effort is the Westinghouse joint-fellowship program at the University of Pittsburgh. Under this plan, the company pays the full salary of researchers sent to get substantial nuclear education.

- Finally, several companies are considering the possibility of setting up their own researcher-training programs in cooperation with convenient colleges and universities.

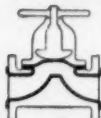
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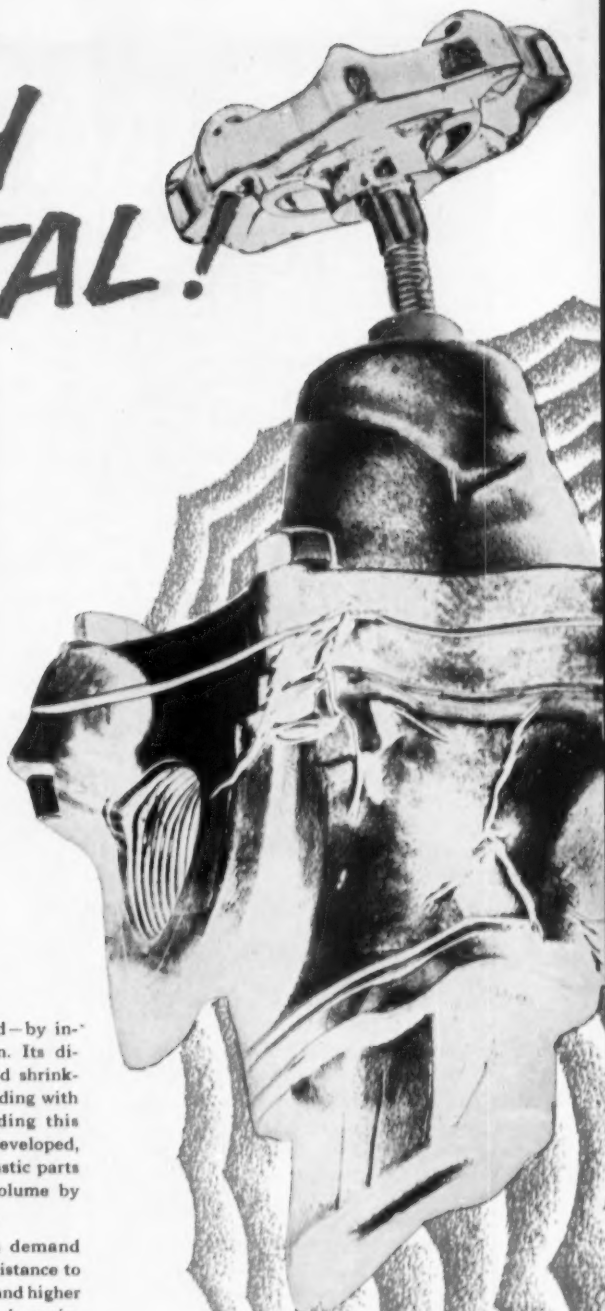
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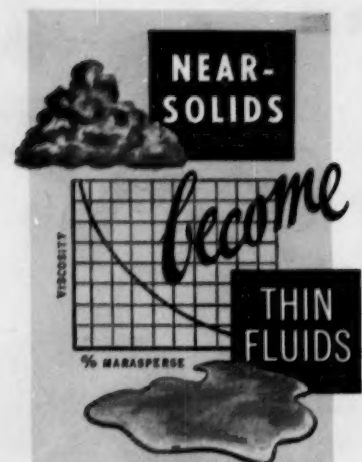


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RESEARCH

of the above alternatives is best for qualifying chemists and engineers for nuclear work. Each case must be decided on its own merits.

But it's probably safe to state that long-term courses are for those who will be attacking new problems of a comprehensive nature—e.g., reactor design. Short-term courses appear to suffice for individuals facing more specialized tasks—e.g., heat-transfer problems. People who intend to carry their nuclear education back into familiar areas of research will probably benefit most from on-the-job training.

AEC schools demand that students (selected by their firms; individual applications are not accepted) possess at least a bachelor degree in a science or engineering. Tuition at Argonne is \$1,500 plus upkeep; at Oak Ridge, it's

\$2,500. Because AEC wants to see the training it provides put into practice as quickly as possible, it gives preference to candidates from companies with strong nuclear programs or plans for intensive effort in this field. For the same reason, it advises companies to select as students experienced people with status in the company—people who will not have to wait for years to apply their new knowledge to advantage.

Aware and Willing: The educational world, for its part, is taking seriously the responsibility of providing nuclear training to undergraduates.

These schools already offer comprehensive programs in nuclear sciences and technology: North Carolina State College, Columbia University, Iowa State College, Massachusetts Institute



All Eyes on Ping-Pong Power

DIFFICULT CONCEPTS are easy when you can see them working. Operating on this assumption, Monsanto, Atomic Energy Commission and the Miamisburg* (Ohio) Community Civic Assn. set up the above demonstration several years ago for more than 68 high schools in the region. The device utilizes ping-

pong balls to demonstrate neutron activity in a power reactor. Primarily a venture in community relations, this exhibition captivated high-school students such as those shown above.

Movies, laboratory and plant tours are other methods that have proved effective in sparking the younger generation's interest in science and industry.

* Miamisburg is the site of AEC's Mound Laboratory (operated by Monsanto).

A Challenge!

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CHEMICAL ENGINEERING is looking for a Ch.E. graduate with up to 3 years of experience, able to write clearly, logically. Personality-wise, he should be able to accept ideas from others . . . work as a member of a closely knit team . . . be eager . . . unafraid of work . . . inquisitive and open-minded, with plenty of personal drive.

Both magazines have headquarters in New York City, with McGraw-Hill, world's largest publisher of business papers and books. If you think you can meet the challenge of one of these editorial opportunities, send us details on your personal background, experience, approximate salary requirements, along with any evidence of your writing ability. All replies will be treated confidentially.



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Chemical Engineering*



*W. Alec Jordan, Editor
Chemical Week*

330 West 42nd Street, New York 36, New York

P.S. If more convenient, you may obtain additional information from these regional editors:

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of Technology, University of Michigan, Pennsylvania State University, University of Tennessee.

New York University and Polytechnic Institute of Brooklyn will launch nuclear curricula this fall. They should be joined soon by University of Michigan and University of California, both of which are building reactors. Most of the above schools, incidentally, do not possess reactors.

In addition, many schools are instituting courses specifically in the chemical aspects of nuclear energy. Illinois Institute of Technology is among those starting such a course next year.

Other educational institutions will be joining the ranks as soon as they are convinced of the great need for nuclear instruction. AEC is now actively engaged in an effort to make the potential demand clear to colleges and universities all over the nation.

Aside from a shortage of qualified instructors, the main obstacles to the launching of new educational programs is the cost and relative unavailability of equipment required to do a comprehensive job. The problem of availability is yielding to the efforts of such companies as American Machine & Foundry and North American Aviation, which can manufacture the tools of the trade (reactors, etc.) at a relatively rapid rate.

Cost, however, is more of a headache. Normal sources of educational funds (endowments, etc.) just aren't adequate to cope with price tags of \$1 million (for a nuclear reactor). The feeling is growing that industry must take a greater part of the money burden on its own shoulders.

In the meantime, AEC is showing schools how to get into nuclear instruction on a relatively small investment. Subcritical exponential reactors, pulse columns, heat-transfer loops, neutron sources, servo-control simulators are examples of relatively low-cost equipment that may be used to launch rewarding programs of instruction.

Some industry groups are seeking ways to increase the flow of young people into engineering and sciences. There is widespread feeling, however, that more can be done by individual companies to spark increased interest on the part of school children in science (see box, p. 58).

By doing what it can, now, industry may be able to minimize many of its future problems in nuclear science.



ATLANTIC'S KEENAN AND FIELD: In petroleum research, a push for accelerators.

Radiation Boost for Octane

Atomic energy uses—subject of last week's international congress*—now seem a good bet to include petroleum processing in the foreseeable future. At least that's the guess of Atlantic Refining Co. (Philadelphia) researchers now probing radiation as a means of wresting a higher proportion of high-octane gasoline from crude oil. Voiced at the firm's recent unveiling of its new \$75,000 atomic particle accelerator, the hope stems from their findings that electron beams can both dissect petroleum molecules and recombine them into more desirable end products.

Although the firm won't disclose details, it does admit that octane-raising fractions have been produced on a research scale and that a pilot plant, built around present irradiating equipment, is under consideration. In general, Atlantic's irradiation studies indicate that alkylation reactions may be economically feasible, but that control of yields and end-product saturation require further investigation. For example, the electron beam can snip butane segments off longer chains, then join two such segments into either a saturated or unsaturated eight-carbon chain.

According to Hugh Field, Atlantic vice-president and general manager of research and development, the new accelerator won't replace the polymerization, alkylation, catalytic cracking, and reforming steps now used in gasoline production. Instead, it looms as the forerunner of an additional step to upgrade fuel.

Up to now, explains Field, petroleum processing has relied on heat, pressure and catalysts to break and reform gasoline molecules into more powerful fuels. But such processing has its limitations—particularly in the waste of potentially useful molecular fragments. Irradiation is expected to minimize such waste.

Moreover, commercial chemical reactions other than those needed for fuels may materialize from the company's radiation studies. Already, Atlantic has made hydrazine (a promising rocket fuel) by bombarding ammonia with radiation. However, yields are too low, at present, to be profitable.

Atlantic's accelerator—reputedly the first of its kind on the East Coast—is a 1-million-volt (m.e.v.) resonance transformer manufactured by General Electric Co. Electrons, moving down inside a vertical tube, are accelerated by magnetic coils up to speeds of 600 million miles/hour, emerge as a tightly

*Held in Geneva, Switzerland, the meeting attracted 1,260 delegates from 72 nations and 7 specialized agencies of the United Nations.

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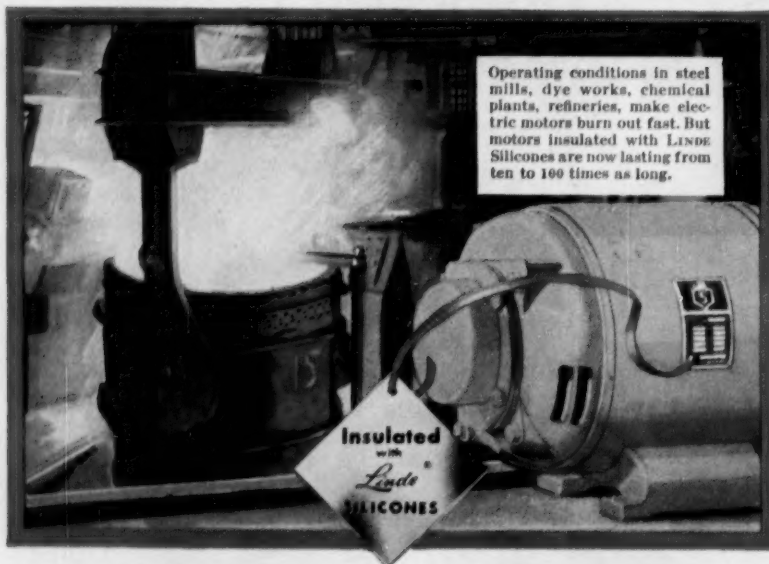
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RESEARCH

focused beam through a stainless steel "window."

For production purposes, it is reportedly possible to raise the output of this type of accelerator as high as 10 m.e.v.

In Atlantic's installation, stray radiation is trapped by concrete walls. Researchers view reactions through a port made from two plates of glass separated by 18 in. of zinc bromide solution. During operation of the electron gun, they are protected by elaborate interlocking switch circuits that automatically switch it off if any of the lead-lined doors in the tower or control room are opened. In addition, survey meters and dosimeters monitor the entire installation.

Vincent Keenan, chemical research supervisor, explains Atlantic's choice of a radiation source as being largely grounded in theory. Electrons—rather than neutral or positively charged particles—were chosen for the molecule-splitting mission because they are more effective, aren't as likely to induce radioactivity in irradiated samples.

The resonance transformer, Keenan adds, has the flexibility (output is varied by a tuning dial), penetration (low, easily shielded) and control (can be turned off with a switch) desirable in either a research or a production machine. Furthermore, maintenance is simplified by the absence of moving parts.

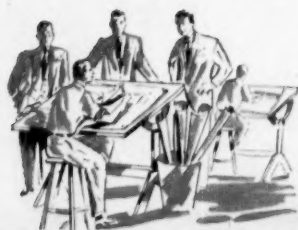
Atlantic's decision to install an atomic particle accelerator came after several years of experiments and collaboration with the Atomic Energy Commission. Construction of its own atomic pile for research did not appear justified because of the availability of several nearby AEC reactors. The firm was granted U.S. patent 2,315,845 in 1943 on the use of radioactive piston rings for engine wear tests, has since applied radioactive tracers in other process control and product applications.

Said to be the only machine of its kind now used in petroleum research, Atlantic's type of accelerator reportedly is winning interest from chemical firms. If it proves successful as a production device, machine-made radiation, already the choice for commercial drug sterilization (CW, Aug. 6, p. 68), may be on its way to a firm hold on processing duties, despite the impending availability of other sources.

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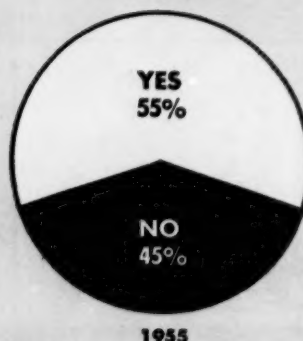
SPECIALTIES

SAMPLING SPECIALTIES MAKERS

Sales this year (so far)
better than last?



Planning expansion (of facilities,
product lines, or personnel)?



QUICK LOOK: Two pairs of pies show that '55's pace isn't slowing.

Pulse Check of '55

Latest CW survey indicates that specialties makers are still optimistic about business prospects.

New facilities, products, personnel are being added to make the most of climbing demands for products of all types.

The talk is of boom sales, rising markets, record-setting production. But the indices, the measuring sticks, are generally those of big business—things like auto production, consumer credit levels, employment statistics—and sometimes the smaller manufacturer wonders if impressions based on other enterprises actually reflect affairs in his own segment of industry.

To check more precisely on how things are going with the specialties makers, CW recently consulted a random sampling of firms across the nation. Happily, the results of this survey show that, in the main, specialties makers are sharing the same prosperity that "big" industry enjoys.

A couple of highlights of the study (see graph):

- A thumping 81% of firms checked tell CW that, so far, sales in '55 are better than last year—a nearly equal 80% (but not always the same firms) say last year's were over '53's. About

8% find '55 approximately the same as '54, saleswise; 11% admit to a slumping volume.

- Fifty-five percent of the firms are planning major changes and expansion—adding to their production facilities, boosting sales forces, or adding new products (and nearly all have several of these moves in mind).

Profile: The majority (70%) of the specialties makers surveyed report sales of \$1 million or over, with another 20% in the \$100,000-\$500,000 class. About two-thirds of the respondents employ under 100 people (18%, 75-100; 14%, 25-50; 20%, 10-25, to list some of the major classifications).

Half of the firms queried are interested in more than one area of specialties manufacture—47% have their hand in soap, detergents and sanitary chemical manufacture; 30%, insecticides; 26%, waxes and floor finishes; 25%, paints and varnishes; 23%, aerosols; 19%, disinfectants and sanitizers.

Those making automobile specialties or fertilizers are under 10%.

Slightly less than half manufacture for one end-use or outlet only (about one-third purely for industrial users; 14% for retail outlets only; 10% for wholesalers alone). Of those producing for several end-uses, the majority (61%) make industrial items; about a third of the total also make wholesaler or retailer products.

Most (61%) of the firms make all their own products. About 12% of those that produce only a portion of their wares have the rest made on contract.

Individualists: One of the widest areas of difference lies in the frequency of full inventory turnover. It varies from once a year to 18 times a year. Four times yearly is par for the largest segment—about 27%. A dozen turnovers a year isn't uncommon (and this is true with makers of nearly all types of specialties).

Too, there is considerable difference on frequency of checks for "dead" items. Forty percent are content with one check a year, but 13% make five or more yearly accountings. The remainder fall in the 2-4 checkups/year category.

Pay as You Grow: For the better-than-half firms planning expansion,

If you are using
ALKYL AMINES

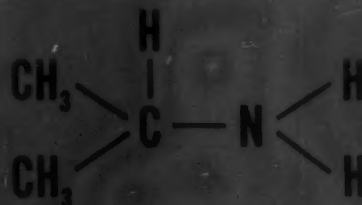
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Storage Facilities and Handling

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2. Less storage space used—no water to store.

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SPECIALTIES

'Sometimes the rest of the chemical industry doesn't realize that specialties often require technically trained salesmen too—and we've got a tough job getting them.'

getting money doesn't appear to be a problem. Well over 60% will finance expansion with a reserve fund, or with cash set aside for growth. About a third will borrow from banks, and 4% plan to issue new stock. Factoring finds no fans (at least among those responding).

How about the firms planning expansion by adding new items—where do they get their products? The survey shows that over 80% have a development section, although several modestly admit it is a one-man affair. Another 10% buy new products from others.

One company has a refreshingly frank answer about the source of its new items: "We stumble onto them, mostly by copying."

Everybody Happy? Albeit sales are good, and expansion seems to be the watchword, specialties makers find their lives are not untroubled (although "no insurmountable problems" seems to be a typical attitude.) Largest areas of complaint cover prices, new competition and difficulties in getting salesmen.

"Cutthroat prices," as several term their problem, applies to every product and manufacturing classification. A sad "our profit is subnormal," in the face of reported rising sales, could well indicate another firm's oblique reaction to low prices.

Salesmen — particularly technically trained ones—have been increasingly hard to find, several firms report. This has long been a very real problem, and chances are it will continue to be.

Among other posers are high forwarding charges, strikes, and patent restrictions that limit new product in-

'I can't quite agree that finding salesmen is the toughest problem—there are enough good ones with my competition to keep me hopping.'

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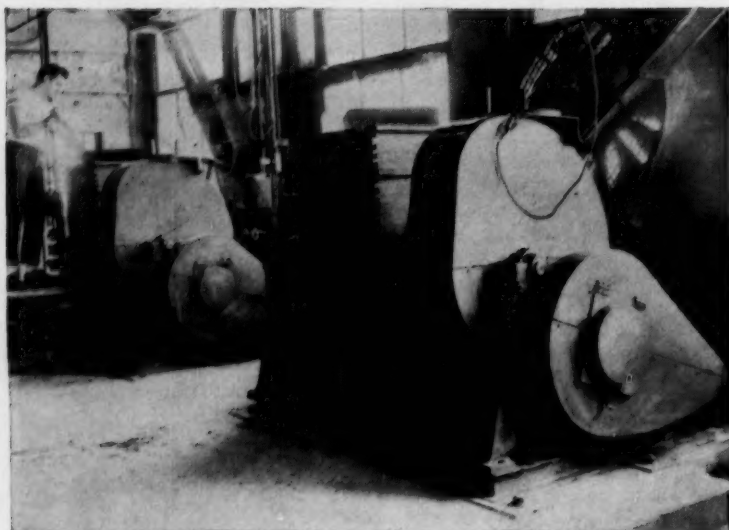
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SPECIALTIES

*'Patents can be helpful—
if they don't reveal more than
they protect. I think they've
kept me away from more new
products than they've given
me an exclusive on.'*

production. One firm says its current problem lies in its reorganization, which has cut into profits.

But these complaints seem more like gentle murmurings, when heard against the evidence of surging business. They show, if anything, a mild dissatisfaction, a feeling that there's room for improvement in their situation.

Antiseptic Suds: David Beaver, Roland Shumard, and Paul Stoffel have come up with a new soap antiseptic for Monsanto (U.S. Pat. 2,713,036). The new compound is of the 4-halo-a'-bis-(5-nitro-2-hydroxy-phenyl)-2,6-xyleneol class, and Monsanto also has patents on its use (0.5%-10%) in soaps.

Slow Grapes: To allow harvesting—and thus marketing—over a longer period of time, a chemical spray has been developed to delay ripening of grapes. The growth-regulating hormone (benzothiazol-2-oxyacetic acid) holds off the ripening of treated grapes about two weeks, experiments at the University of California College of Agriculture (Berkeley, Calif.) indicate. Since the tests aren't complete, the university doesn't yet recommend commercial use.

Strong When Wet: To boost strength of paper when wet, William Fowler, Jr., Donald Spear, and Lee Tong have worked out a treatment for pulp for Eastman Kodak Co. (U.S. Pat. 2,713,539). The process makes use of a sizing aid (0.15-1.5%); a polyalkyl acrylate (alkyl, not more than two carbon atoms, 0.75-15%; wax (0.75-7.5%); an aluminum salt (either the sulfate or chloride), 1-10%.

Clean Record: Phonograph records, photographic negatives, printing plates are some of the things which a new aerosol product is intended to keep dustless. The antistatic spray, by Braun Laboratories (Philadelphia) retails at \$2.95 for 12 oz.



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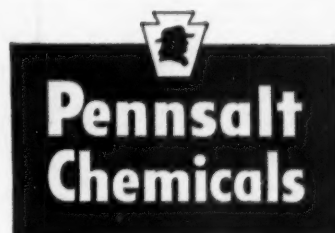
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SPECIALTIES



Philadelphia's Operation Pestop

ALONG ABOUT FIVE in the morning last week, Operation Pestop got under way in Philadelphia. A campaign designed to quell everything from mosquitoes (with DDT sprayed into sewers, *above*) and ragweed (with herbicides, *below*) to rats (with cyanide), it covers some 230 city blocks, where about 50,000 people live.

Thought to be the largest muni-

cipally sponsored antipest campaign tried, Pestop enlists householders, sanitation and health departments. Before the spraying began, campaigners in a loudspeaker-equipped car explained the operation, reassured householders about the safety of the program. By working early in the morning, most evidence of the spraying is gone long before most of the residents have arisen.



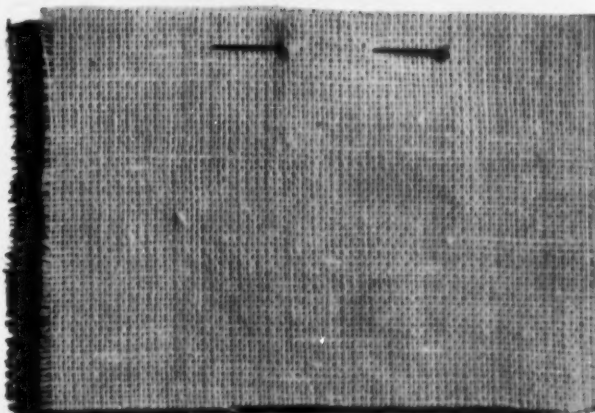
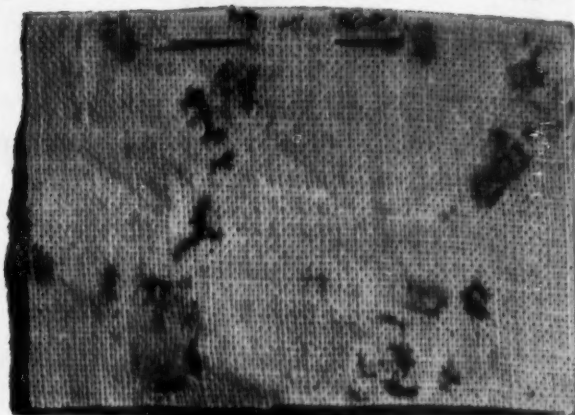


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*Liquid starch size containing
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DOWICIDE® PRESERVATIVES make the difference so obvious here. These two grey goods samples are identical in all but one respect: sample at top, above, is sized with *unpreserved* starch; piece below is warp-sized with liquid starch containing a Dowicide Preservative. Samples were exposed for equal time to conditions favoring mold growth. Piece with *untreated* size is discolored and weakened—costlier, heavy bleaching is now necessary to remove discoloration. In contrast, sample with *preserved* size has effectively resisted mildew.

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SPECIALTIES



DISCOVERER SVEDA: Du Pont got a sweet bargain.

Sugar Subs' Squabble

Abbott Laboratories has sharpened its weapon for the just-beginning battle of cyclamate sweeteners. To eliminate Sucaryl's tendency to leave a bitter after-taste, a pinch of saccharin (1 part to 10 parts Sucaryl) has been added (each alone has an after-taste, but the combination doesn't). The sweetener combination, Abbott feels, should give it an edge on competition—current and upcoming—that recently caught it (long sole cyclamate maker) by surprise.

It was just last month that Du Pont (holder of the basic cyclamate patents) brought out its own brand—Cylan—in competition with Du Pont-licenssee Abbott (*CW*, July 30, p. 64). At least two others can be counted in also: Charles Pfizer & Co. (Brooklyn, N.Y.) is selling cyclamate now; Merck & Co. (Rahway, N.J.) will be marketing in September.

Behind the Fight: The competitive spirit is understandable. Sucaryl has been booming since Abbott introduced it in 1950. Michael Sveda, while still a student at the University of Illinois in the '30s, discovered the substance, took it with him when he moved to Du Pont in 1940. Abbott's Ernest Volwiler ran across it there, got a license and, after several years' research, set up production.

Current public weight-consciousness, plus Sucaryl's compatibility with numerous commercial food products,

RESORCINOL?

WHAT'S THAT?



It's time you knew, young lady, since you're really quite dependent on it. Resorcinol may well be responsible for the color in your lipstick, rouge, and nail lacquer. Your skirt and blouse probably owe their color to Resorcinol, since many dyes are manufactured from this versatile chemical for tinting wool, cotton, silk, and synthetic fiber goods.

There's a good possibility that a

waterproof resorcinol-based adhesive was used to laminate the wood heads of your golf clubs. What's more, a resorcinol compound could have been employed as a light screening agent in that plastic canopy above you to protect it from weather and sunshine discoloration.

Turning our attention away from you for a moment, let's consider your car. Those tubeless tires are extra-

strong and longer wearing because they are reinforced with powerful synthetic fiber cords. The adhesive used to form a lasting bond between synthetic fibers and rubber also contains resorcinol.

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SPECIALTIES

has created a whole new grocery field (example: the low-calorie soft drinks—No-Cal, Trim, Glamor Sugar Free, Dieticious Dad's, among others). Saccharin, the other popular nonnutritive sweetener, hasn't gone into many processed foods because of its instability under acid and heat, its tendency to leave a bitter after-taste.*

The apparent rush is coming from firms wanting to get in early—during the Du Pont patent's last four years (the U.S. patent expires March, '59, the Canadian expires March, '60). Abbott's Sucaryl price has been going down steadily; the longer a firm waits to get in, the more it will cost during the expensive first stages.

Although Du Pont makes its own, both Merck and Pfizer are buying from one of the two producers. (Pfizer admits it is buying from Abbott, Du Pont denies that it is selling to either Merck or Pfizer.) Pfizer says that if sales are satisfactory it expects to go into production itself as soon as Du Pont's patent runs out.

Segregated Sweets: Toward the first of the year, complications were expected from the Food & Drug Administration (CW, Jan. 29, p. 78). A worried-sounding report from the Food & Nutrition Board, National Research Council, complained that human tolerance for unlimited use was not established, set FDA investigating.

Food & Nutrition is about to issue a new report. Abbott and Du Pont don't know what it will contain, but they believe they have submitted enough evidence to get a favorable finding. Meanwhile, FDA and many state regulations require:

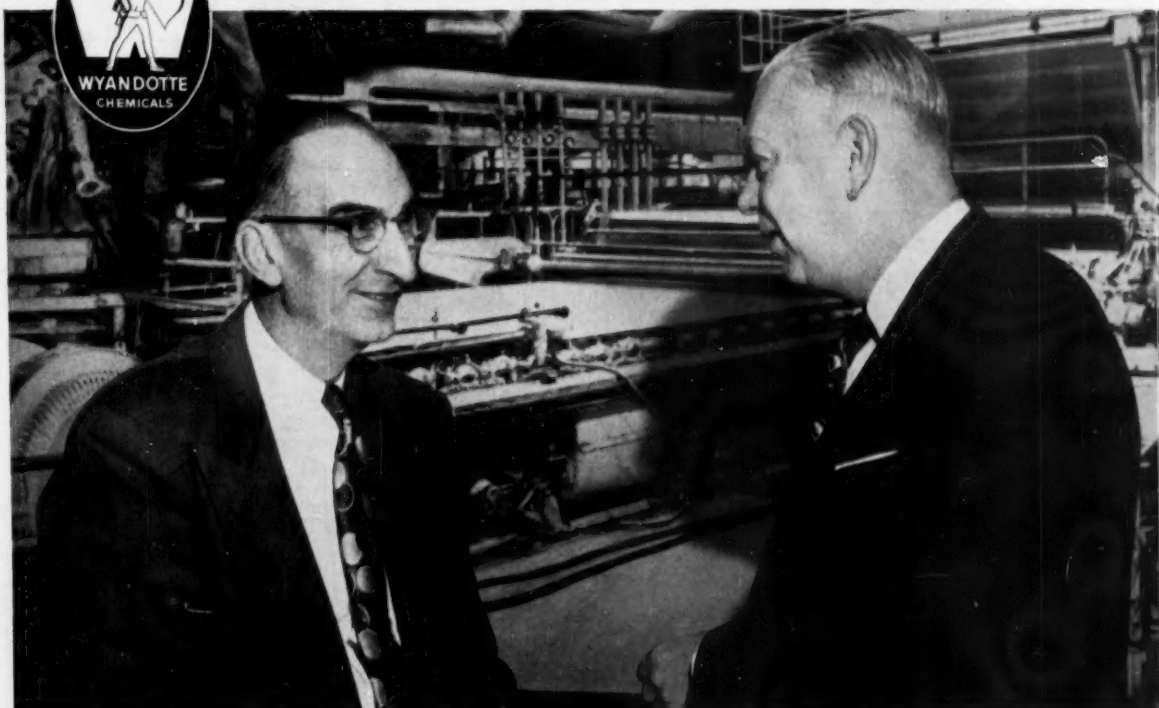
- Special labeling for artificially sweetened products (indicating that product is for special dietary use).
- FDA permission for use in foods covered by standards of identity.
- In some states, segregation of artificially sweetened products from others on grocery shelves.

Supermarket Worries: Abbott feels confident that its established position along with its new formula (the exact 1-10 ratio of which—1 part saccharin to 10 parts Sucaryl—is pat-

*But saccharin is on the move, too. Monsanto (the biggest producer) has improved the product considerably; Plough Sales Corp. (Memphis, Tenn.) is making an effervescent form; Rexall Drug Co. (Los Angeles, Calif.) has a crystal variety for cereals and fruits; E. R. Squibb & Sons (New York) has a liquid saccharin in a squeeze bottle (now being plugged in a \$180,000 advertising campaign).



Dependable Source for Chemical Raw Materials



Discussing new product developments are: K. F. Speelman (left), director of purchases for Minnesota and Ontario Paper Company, and W. H. Schlafge, general manager of the company's International Falls Division.

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— K. F. Speelman, Minnesota and Ontario Paper Company

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In speaking of purchasing for this vast enterprise, K. F. Speelman, Director of Purchases, says: "The very existence of a company of such magnitude — to say nothing of the well-being of its many employees — depends in a great measure on sound purchasing

practices. Therefore, it is absolutely essential that we, who make the purchases, have on tap a vast number of suppliers of all kinds of commodities.

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tive? Or write us, giving as many details as possible about your uses for chemical raw materials — together with specifications and requirements — so that we may be of maximum help to you at the earliest possible date. *Wyandotte Chemicals Corporation, Wyandotte, Michigan. Offices in principal cities.*



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SPECIALTIES

ented)** will keep it ahead. Another bolster, for the direct-to-consumer market, is a new calcium cyclamate tablet. Previously the tablet form (handy for coffee) has been available only in sodium (many people are also restricted to salt-free diets).

Perhaps the biggest worry is that somebody will put the consumer forms of cyclamate into the supermarkets. Abbott, Pfizer and Merck, pharmaceutical houses all, have avoided the grocery outlets—fearful that they will irritate their druggist friends. But several others have shown interest in the sweeteners. If one of these should put cyclamates so handy to home cooks, the artificial sweeteners may be in for another sales spurt—and new competitive patterns.

**Although Abbott admits that 1-9 or 1-11 will give practically as good results.



Asian Cooperation

INDIA's ace plant pathologist, Dr. R. N. S. Vasudeva (*right*), has just left the Philippine Islands after two months' work on plant diseases in that nation. Under the auspices of the U. N. Technical Assistance program, after a request by the Philippine government, Vasudeva visited the islands seeking control measures for diseases of coconut trees and abaca plants. Copra and hemp, derived from the plants, are vital parts of the Philippine economy—and so far, pesticides alone have not prevented loss to disease.

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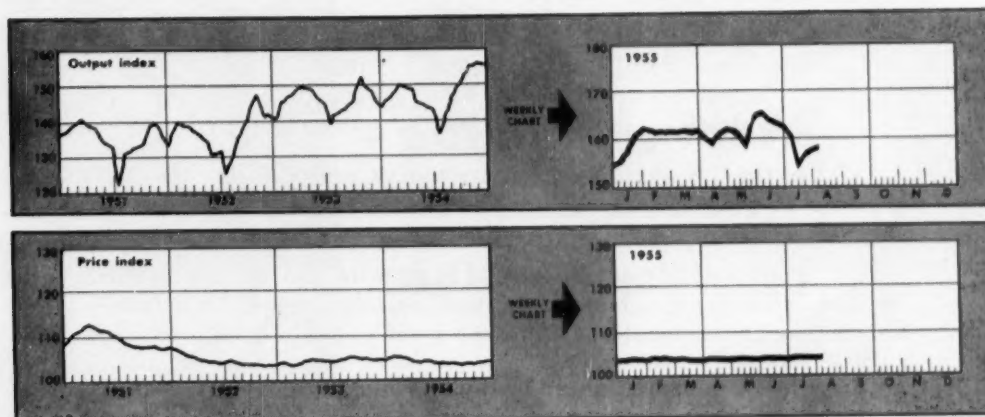
Oronite's unique classifying system in the manufacturing process eliminates the fine dust particles from D-40SF, providing you a desirable dust-free product. Prove this to your own satisfaction. Write for a free sample of D-40SF and compare it to the product you are now using. You'll see the difference immediately. And this extra quality feature of D-40SF is at no premium in cost.

Oronite, the world's largest producer of detergent raw materials, offers Detergent D-40 in three different particle sizes—flakes (D-40SF), granules (D-40) and powder (D-40FG). Write any Oronite office for free samples or "use" bulletins showing a variety of fields where D-40 can be successfully used.

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MARKETS



WEEKLY BUSINESS INDICATORS

	Latest Week	Preceding Week	Year Ago
CHEMICAL WEEK Output Index (1947-49=100)	158.0	158.5	140.6
CHEMICAL WEEK Wholesale Price Index (1947=100)	104.1	104.4	104.3
Stock Price Index of 11 Chemical Companies (Standard & Poor's Corp.)	442.6	451.6	316.8

MONTHLY INDICATORS—Wholesale Prices (Index 1947-49=100)

	Latest Month	Preceding Month	Year Ago
All Commodities (Other than Farm and Foods)	116.5	115.6	114.3
Chemicals and Allied Products	106.0	106.8	106.7
Industrial Chemicals	118.2	117.8	117.1

MARKET LETTER

Selenium continues to hover near the top of the list of tight items. An indication of its scarcity can be inferred from the prices that strapped consumers (in the chemical, glassware, pigment and rubber industries) have been charged.

Resellers, for example, are reportedly asking—and getting—two or three times the primary producers' schedule. And the resale tags may go up again. Reason: at least one selenium maker late last week raised his domestic price to \$10/lb. from the \$7/lb. level that has been in effect only since January.

Virtual doubling of the price of natural rubber over the last year is cited as the chief reason for new increases on foam rubber products.

Firestone's furniture and bedding, and pillows made primarily of natural rubber latex are up 10%; sheet stock and foam rubber slabs (which use larger proportions of lower-cost synthetic rubber) are being hiked 5%.

On a worldwide basis, production and consumption of rubber (both natural and synthetic) are on an uptrend. That's the nub of the latest Dept. of Commerce evaluation, based on estimates of the Secretariat of the International Rubber Study Group.

MARKET LETTER

Capsule comparison for the first six months of 1954 and 1955:

	Consumption		Production (thousand tons)	
	1954	1955	1954	1955
Natural	875	945	825	870
Synthetic	373	505	351	505

In the U.S. alone, total consumption of rubber during the January-June '55 period jumped 23.7%—from 623,214 tons to 770,701.

Polyvinyl acetate use in this country is also pitched upward. Demand—from paint, adhesives, and textile-sizing makers particularly—has increased hearteningly, at times to a point where existing production facilities have been inadequate.

Result in one instance: Dewey and Almy is this week doubling production of its acetate polymers and copolymers. The firm is mum on official figures, of course, but trade guessers estimate that capacity now will tally close to 7 million lbs./year.

Western Canada's chlorine and caustic soda consumers needn't fret about supplies, now or later. A twofold boost in productive facilities has just been completed at Western Chemicals, Ltd.'s \$3.5-million plant at Duvernay, Alta. New rated capacity: 20 tons/day of chlorine, 24 tons/day of caustic. And engineering studies and estimates for another doubling are well advanced.

Several weeks ago, word was posted that phenol prices were going up 1¢/lb. to set a July 1 contract quote of 17¢. Since then, contract complications—and competition—have made the higher price one for the books only. Actually, phenol buyers are still paying the earlier 16¢.

But while some sellers are finding it embarrassing to maintain a "phoney" pricing schedule, chances are the end of this quarter will bring a solution of the problem—and 17¢ phenol will be industry standard.

Isophthalic acid is well on the way to fulfilling a pricing prediction (*CW*, Aug. 29, '53, p. 61). Tag on the material, due to trickle out of Oronite's new 50-million-lbs./year plant at Richmond, Calif., in October, will read 23¢/lb. That comes well within range of bucking competitive phthalic anhydride's current 20¢.

SELECTED CHEMICAL MARKET PRICE CHANGES—Week Ending August 15, 1955

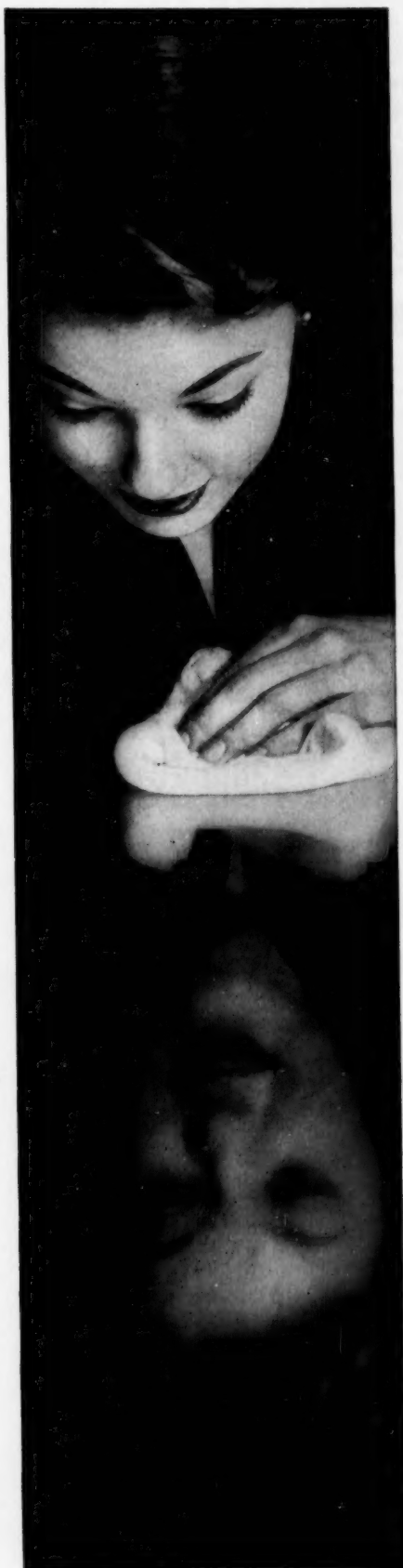
UP

	Change	New Price		Change	New Price
Butyl lactate, tanks, frt. alld. E.			Copper oxide, red, 97%, USN Type		
Rockies	.07	.40	1, bbls.	.04	.575
			Selenium, powd. dms., dlvd.	3.00	10.00

DOWN

Potassium stannate, dms., frt. alld. E.	.004	.689	Tin, metal, straits	.0075	.9625
Stannous chloride, anhyd., dms., works	.006	.830			

All prices per pound unless quantity is stated.



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**but luckily for her,
this polish
maker does!**

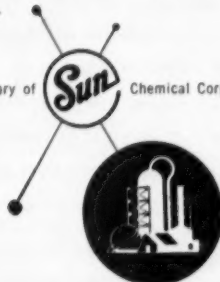


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CARDIS ONE (melting point 195°-200°F) is one of the many new waxes developed by Warwick to provide manufacturers with formulations that answer the growing consumer demand for wax-rich polishes. For facts about wax, come to Warwick. Samples, suggested formulations and technical service available—without obligation—by writing or telephoning to . . .

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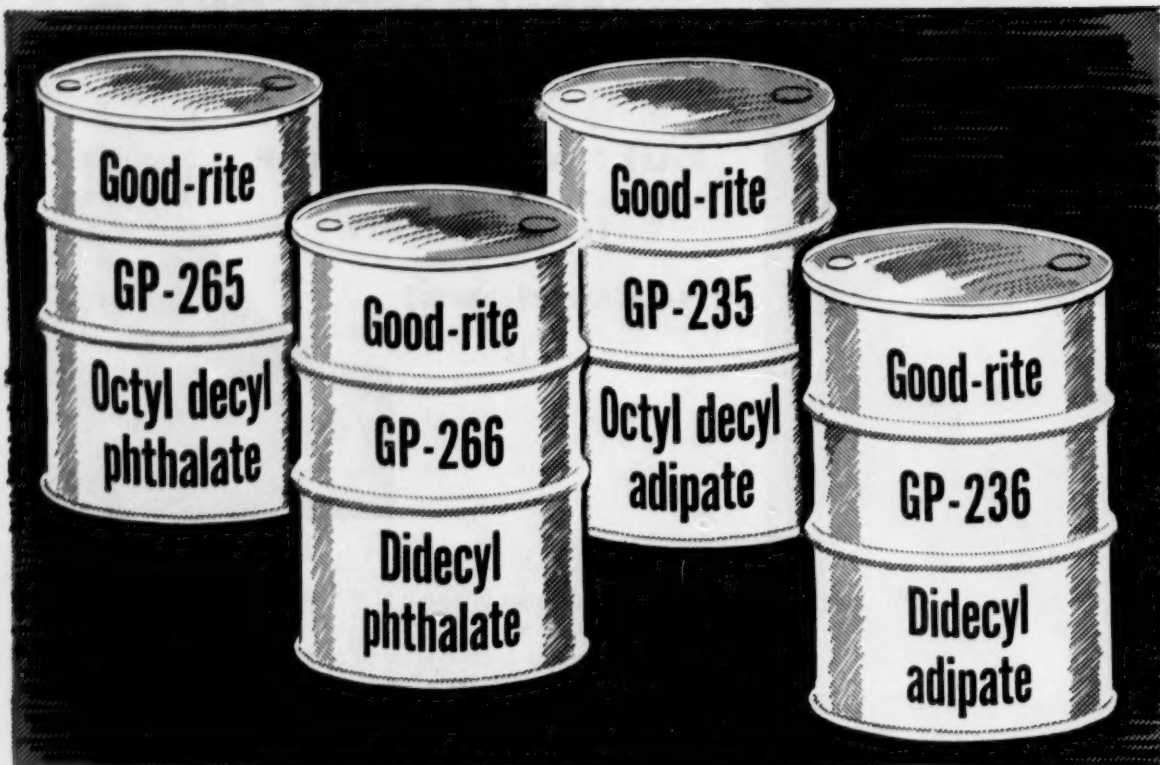
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GP-235 and GP-236 are characterized by low volatility, high permanence, good dielectric properties, and excellent low temperature flexibility.

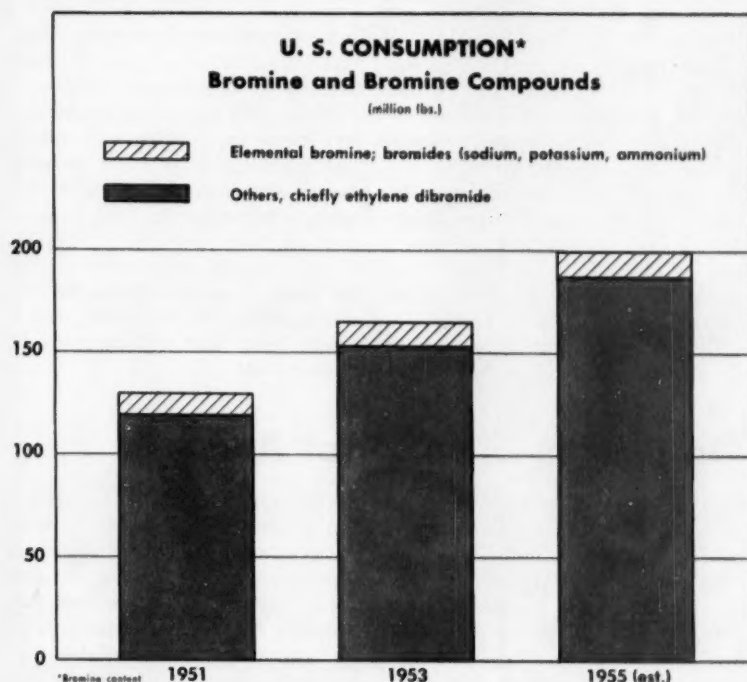
For technical literature, please write Dept. K-9, B. F. Goodrich Chemical Company, Rose Building, Cleveland 15, Ohio. Cable address: Goodchemco. In Canada: Kitchener, Ontario.



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Firm Base for a Boost?

Bromine consumption, now crowding 200 million lbs./year, seems destined for another push upward. Reasons: wider use of bromides, especially in fumigation; stepped-up demand for gasoline.

The latter means more ethylene dibromide for tetraethyl lead, but some long-range developments portend a possible change.

By the end of this year bromine sales in the U.S. will be the highest in the industry's history. Consumers are expected to buy at least 200 million lbs. (bromine content) of the element and its derivatives. That tops, by some 36 million lbs., the last officially reported (for 1953) record volume of slightly more than 164 million lbs. It'll exceed, too, the estimated 185 million—based on incomplete reports from primary producers—of the total bromine and bromine compounds sold last year.

Ethylene dibromide, via its use as a component of antiknock tetraethyl lead mixtures, will, in '55, as it has in the past, be chiefly responsible for the boost in bromine consumption—it accounts for perhaps 90% of the bromine sold.

Beetle Bump: At this very moment, though, in some Western states, a

beetle is doing a bit toward broadening another bromine outlet, will, in a minor way, also nudge total sales of bromine. Methyl bromide is currently being used as a fumigant in an effort to halt the Khapra beetle's voracious munch through millions of dollars worth of stored sacked food.*

Particularly imperiled is grain stored in some 200 warehouses in California, Arizona and New Mexico, which have been found to be infected with the destructive—and unfortunately highly reproductive—insect.

Under a concerted California program of eradication, about 50 large commercial storage bins (with a capacity of some 18 million cu. ft.), have already been enveloped in circus-size plastic tents and fumigated. Scheduled

* Beetles have been found in wheat, powdered milk, nuts, spaghetti, rice, oats, barley, bran, rye, malt, and seeds of various leguminous crops.

for the same treatment later this year are an additional 110 units, mainly smaller on-the-farm buildings. Total storage area of the latter group: nearly 38 million cu. ft. That adds up to orders, from the one state alone, for 250-260,000 lbs. of the bromide this year.

And it's no one-shot market. California is reportedly budgeting for a similar project next year; and though the beetle will be eliminated eventually, experts think it will take a few years. Result: a tidy, if not big-time, outlet for bromine in food fumigants.

Perhaps a more reliable methyl bromide consumer over the longer term is fumigation of seed-beds. Statistics, of course, are not officially available, but one estimate indicates that something over 1.8 million lbs. were consumed on such beds (tobacco, celery, etc.) during 1954. A fairly safe guess for the future: within a year or two, consumption will considerably top 2 million lbs./year. And, since the U.S. is virtually the only producer, exports will likely add a sizable chunk to that estimate.

Bromine Dispersion: Use of elemental bromine (in water treatment, etc.) is relatively small. But through a lengthening list of compounds—and recent solving of some tough transportation and handling problems—its consumption has spurred impressively. Note this 1949-53 comparison of bromine and bromides (gross weight) sales by the country's primary producers†: in '49, about 104.8 million lbs.; during '53, 192.6 million.

In the "Other" category (see chart), which is predominantly ethylene dibromide, are a number of less common, but potentially fair-size, bromine users, including the bromides (lithium, calcium, aluminum, etc.) as well as bromochloromethane.

The latter is an effective extinguisher of gasoline and electrical fires; today the Air Force is the best customer. Its major advantage is its safety, but corrosive properties could be a deterrent to wider sales. Avers one bromochloro roofer, however: if that proves no problem, it's only a matter of time until it "replaces carbon tetrachloride as an extinguisher on commercial planes, too, and in general civilian use."

Its impossible to pinpoint all outlets

† Major bromine producers, by order of volume: Ethyl-Dow Chemical; Dow Chemical; Michigan Chemical; American Potash; Westvaco; Great Lakes Chemical. First two turn out a large part of the total.

for bromine, but here's a brief run-down of some bromide end-use indications:

- Sodium, potassium, lithium, calcium, strontium, and magnesium bromides are used chiefly in pharmaceuticals. It's been estimated that such bromine derivatives comprise 10-15% of all medical prescriptions.

- Sodium and potassium compounds filter into photography, emulsions and lithography.

- Aluminum bromide is used as a catalyst in many bromine reactions.

Gasoline Prop: All other bromine uses combined, however, come nowhere near matching the amount consumed in producing ethylene dibromide. And although the dibromide has some other important uses (soil fumigation last year took 8-10 million lbs.), the dominant tonnage consumer is tetraethyl lead.

The future of TEL has of late generated much interest, not only in the chemical industry, but also in several allied fields. Lead sellers, petroleum refiners, automobile makers—even the government—are all pondering the poser: Is TEL on the way out as an antiknock agent?

The Bureau of Mines, for example, in a chapter of its upcoming book, "Mineral Facts and Problems," points out a number of threats to a substantial portion of the market for ethylene dibromide. For one: wider acceptance of jet planes, which do not require fuels with TEL additive. Another: development of automobile engines that can be operated without high-octane fuels.

Further, the bureau notes that nearly 15% of the nation's supply of lead goes into tetraethyl lead and is subsequently lost in the atmosphere. Thus a possible future need for conserving the metal could jeopardize the bromine market.

But these conclusions are apparently bothering few in the bromine business. While conceding that TEL could be affected by these and other factors (e.g., methods of producing high-octane gasoline other than by the addition of lead), many shrug off the implications as being "away off in the future."

As a matter of fact, there are no dips in the anticipated gasoline consumption curve for the foreseeable future. Demand, by the end of '55, will hit about 1.4 billion bbls.—substantially

higher than last year's 1.3 billion—and continue upward from there.

Perhaps the clincher that TEL outlook—and concomitantly that of bromine and ethylene dibromide—is indeed bright, is the extent of current and proposed industry growth.

Ethyl has just completed a new expansion program at its Baton Rouge and Houston plants; and the newly formed Ethyl Corp. of Canada has started construction of a \$14-million antiknock plant at Sarnia, Ont.

Du Pont, too, is just about ready to put up a new multimillion-dollar tetra-

ethyl lead installation in California. And Dow, reportedly, has been busily building additional ethylene dibromide capacity to fill increasing orders.

Thus, with the major bromine outlet's future apparently well assured and consumption of other bromides expected to inch up favorably (particularly in fumigation of soil, food and seed; in drugs; in water sterilization; in inks and dyes; and a raft of others), the corollary seems obvious. Bromine consumption and production, now at a high level, may well be ready for another leap.

On Argon, Discordant Accord

Argon production in the U.S. is on the increase. Last year, for example, output topped the previous high (1953) by some 6%, and this year the upswing should be greater. Reason: new expansion will bring the industry's productive capacity to an impressive 550 million cu. ft./year.

That's one salient fact revealed this week in the Business & Defense Services Administration's special argon production-consumption survey.

The industry canvass also discloses that record-breaking gains were made in argon consumption during 1954. The aluminum and steel industries are rated as the principal users in '54 (as well as in '53).

Here's the capacity-turnout-use summation:

- Plant expansions announced this June indicate that 12 companies will be operating 21 plants by the end of '56, upping capacity some 22% above the current level.

- Argon consumption last year hit a peak of nearly 179 million cu. ft., exceeding usage in '53 by 13%.

- Domestic production in '54 reached an all-time high of some 185 million cu. ft.

Despite the official stamp on these argon statistics, some acute trade followers—off the record—knowingly insist that the data presented by the government agency are far too "conservative." As in the past, inside-industry figures tend to be higher than those reported to and by the U. S. Dept. of Commerce. For instance, according to at least one marketer, argon production last year surpassed the 200-million-cu.-ft. mark—and that by a wide margin.

The implications, however, aren't as bad as they seem. No one is deliberately giving the government bureaus a wrong steer on statistics, but producers' reports are, in essence, only estimates; by the time of publication, the figures are simply out of date.

Although the BDSA survey and private data are not precisely in accord, there is agreement that argon is coming closer to matching oxygen's sales-dollar value; consumption of the former is due for another hardy push upward.

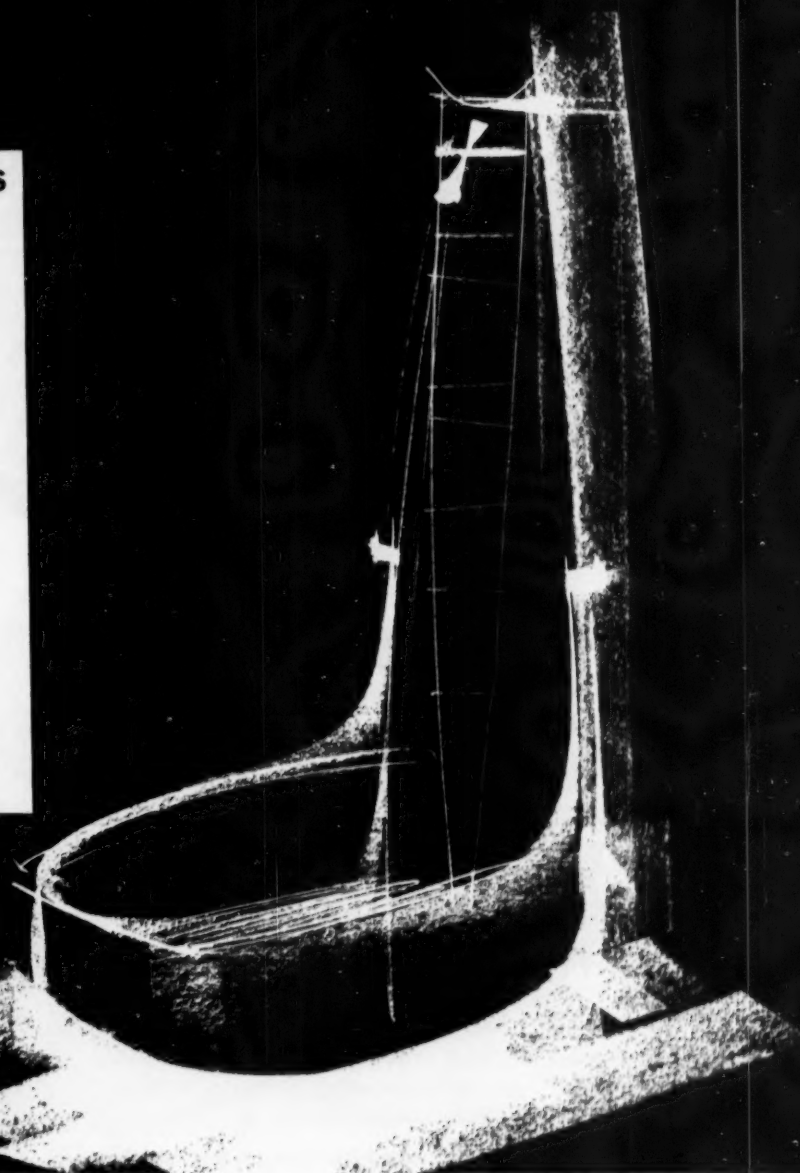
Aluminum, of course, accounts for most of the argon consumed in inert arc welding, the primary outlet for purified argon. Production of the lightweight metal last year reached a near-3 billion lbs. (compared with the previous year's 2.5 billion), and today's continued increase in demand spells out a concurrent need for more argon.

Talk of more titanium, too, means more argon requirements. At the moment, use of the gas in titanium refining operations probably does not exceed 10% of the total argon sold, but that amount will certainly jump if all the would-be titanium makers get into production.

Another important argon user, according to the BDSA report, is the aircraft industry; last year it took about 15% of the argon produced. Electric lamps and electronics field accounted for approximately 7%.

Although argon's consumption curve appears to be on a steep incline, ambitious producers are making certain no customer will be shorted: next year's expansion in capacity will be more than enough to cover all eventualities.

Bringing new products into **FOCUS**



Could a low-cost shower-tub find a market in millions of homes and summer cottages?

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With the number of home-dwelling Americans increasing every year, the need for additional bathing facilities is becoming increasingly acute.

It seems likely that a tub and shower that is low in cost and easy to install could help solve the problem. It could create an auxiliary unit for home basements or attics. It could improve the conveniences of millions of summer cottages.

The ideal material for such a combination tub and shower is at hand. By using fibrous glass, bonded with polyester resins, the unit could be easily molded in one piece.

It would be light in weight, smooth in finish, compact in design and colorful in appearance. The water could be brought up to the shower head through pipes

which also serve as structural members.

The uses of reinforced plastic materials are growing every year. They are already widely applied to sports car bodies, boats, corrugated building panels, modern furniture, air conditioning ducts.

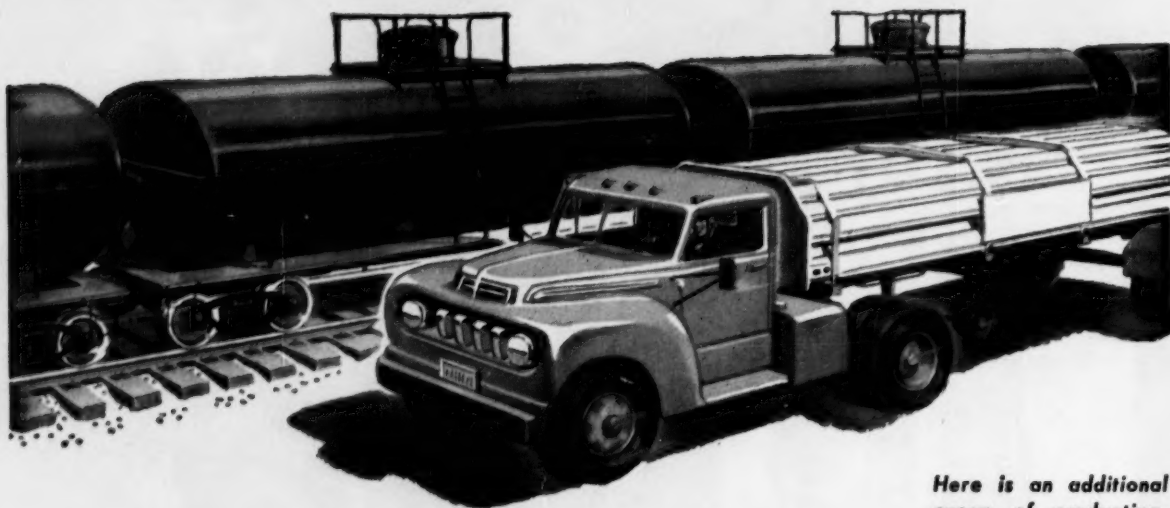
The basic ingredients for manufacturing polyester resins are supplied by Monsanto. These include Monsanto styrene monomer and phthalic and maleic anhydrides.

If you would like a glimpse of other possible new uses for reinforced plastics, you are invited to request "A Sketchbook of Profitable Products." Write on your letterhead to Monsanto Chemical Company,

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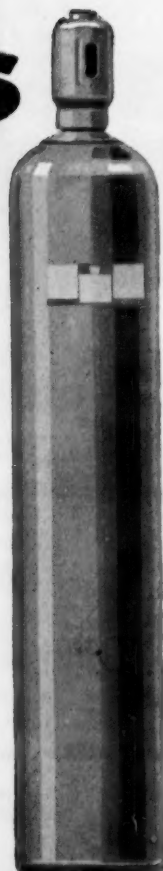
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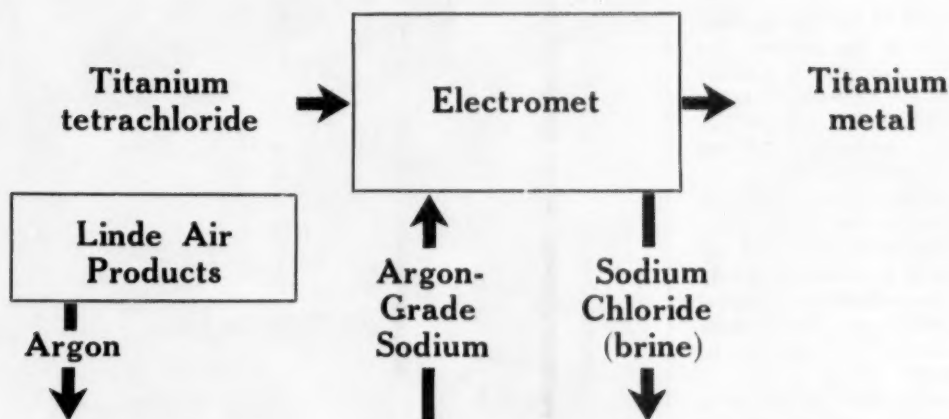
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PRODUCTION



PROXIMITY of USI (above) and Union Carbide plant sites shortens route of . . .

High-Purity Sodium for Titanium Process

The next best thing to a totally self-sufficient chemical process is a ready supply of raw material right in your own back yard. So it was a natural for Union Carbide's abuilding Electro Metallurgical Division (Ashtabula, O.) to contract with adjacent U.S. Industrial Chemicals Division of National Distillers for the sodium metal to be used in reducing titanium tetrachloride to titanium metal.

Due in operation by mid-1956, Electromet's 7,500-ton/year plant will be the first in this country to employ the sodium reduction process. And to safeguard the product's critical purity requirements, it will use argon-grade sodium (99.95% pure) produced by

a special ND-developed refining process (CW, March 19, p. 90).

Argon for high-purity sodium refining will be supplied by nearby Linde Air Products Division of Union Carbide.

Employed as the oxygen-excluding inert gas blanket in Downs cells and microporous stainless steel filters, argon prevents formation of nitrides as well as of oxides.

Shipment of sodium in argon-purged tank cars will essentially be a simple switching operation over the short 3-mile distance between plants. Delivery by direct pipeline was also studied, but was considered less practical than tank cars, which can be used for con-

venient storage at both ends of the line.

Completing the flow of material between plants, a brine pipeline will carry by-product sodium chloride from titanium reduction process back to USI, where it will be combined with calcium chloride in the Downs cells, re-refined into metallic sodium.

Imperial Chemical Industries, Ltd. (London) also has a sodium reduction process, which will probably be used by Columbia Titanium Co., the proposed joint subsidiary of ICI and Columbia - Southern Chemical Corp. (Pittsburgh, Pa.). If current negotiations result in a contract, ICI and C-S will build a \$10-million, 5,000-ton/year plant at Natrium, W. Va.

Rare Exchange

You can expect to be hearing more about the use of ion exchange for separating the rare earths. Lindsay Chemical (West Chicago, Ill.) last fortnight announced it had put into operation the first commercial unit to employ the technique. But the Research Laboratories of Colorado (Newtown, O.) has been quietly working along the same lines and it's touch-and-go as to which one is first. Two other firms—Michigan Chemical (St. Louis, Mich.) and United States Yttrium (Laramie, Wyo.)—may also be in the running.

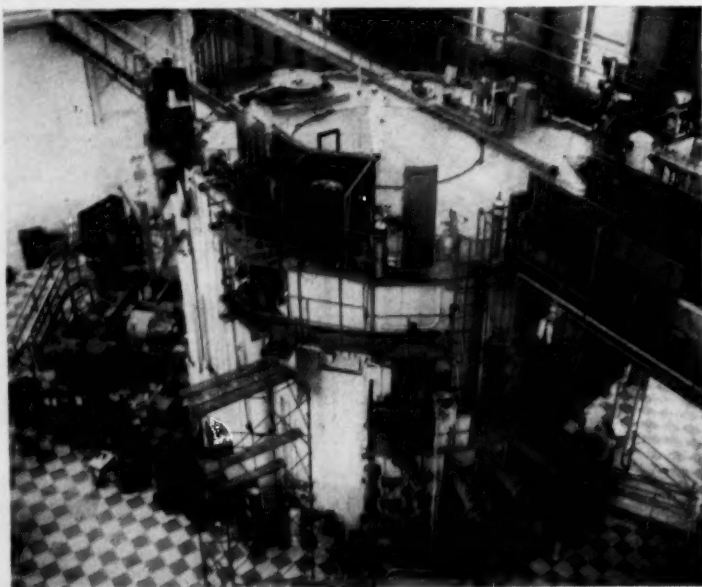
There is some question, in fact, as to what constitutes a "commercial" rare earth operation. Lindsay says it will charge about 50 lbs. a day of crude to its unit; output will be measured in grams or even milligrams. But Lindsay will probably start with monazite tailings, and its charge rate can't be related to that of Research Labs, which will employ gadolinite. (The former is a phosphate rich in the light rare earths of the cerium subgroup; the latter is a black silicate rich in the heavy rare earths of the yttrium subgroup.) However, the two operations will probably be of the same order of magnitude.

One of the few things about the operation that isn't open to some question at the moment is the credit for the basic ion exchange technique. That goes to Mr. Rare Earths himself, Frank Spedding, of Iowa State College. Spedding and his group developed the ion exchange process some time back (*CW*, March 29 '52, p. 39), have since been pilot-planting it.

According to published work of Spedding, the process works like this:

The rare earths are removed from the ore by dissolving them in nitric acid. Then impurities such as iron and beryllium are removed by a treatment with oxalic acid, which precipitates the rare earths as oxalates. They, in turn, are ignited to the trivalent oxides.

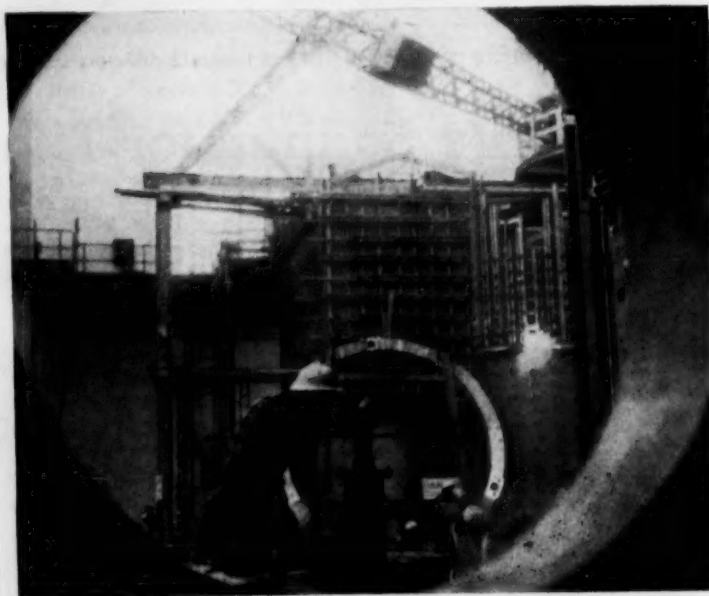
The oxides are dissolved in hydrochloric acid and charged to an ion exchange column packed with a resin made of a sulfonated styrene-divinylbenzene copolymer. The rare earths form a band near the top of the column; separation is accomplished



An Atomic Challenge

AS THE CANADIANS see it, the old saying that "them what has, gets" may be illiterate. But they're doing their best to see that it's not inaccurate. Blessed with an abundance of hydroelectric power sources as well as other types of fuel, they're vigorously making sure that they'll get atomic energy, too. At Chalk

River, Ont., they have one reactor (*above*) now producing isotopes being used in studies for industry, agriculture and medicine. In addition, they're building a big, new reactor (*below*), and have another one in the planning stage. By 1958, the nation hopes to have its first atomic-power pilot plant.





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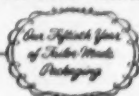
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Fast growing chemical company requires services of tonight production and marketing specialist to coordinate plasticizer program in a coast-to-coast decentralized plant operation. Send complete resume including education, experience and salary desired. Reply to

P-7410 Chemical Week
330 W. 42 St., New York 36, N. Y.

EMPLOYMENT

WANTED

VINYL CHEMIST

Manufacturer calendered film and vinyl sheeting requires experienced chemical engineer or chemist. All replies confidential. Reply

P-7322 CHEMICAL WEEK
330 W. 42nd St., New York 36, N. Y.

REQUIRED

VINYL COLOR MATCHER

Man experienced in color matching and production color control in film and sheeting. Reply

P-7324 CHEMICAL WEEK
330 W. 42 St. New York 36, N. Y.

WANTED

FLOOR TILE CHEMIST

Experienced manufacture Vinyl Tile. Location, Midwest. Liberal Insurance and Pension Plan. Reply

P-7325 CHEMICAL WEEK
330 W. 42nd St., New York 36, N. Y.

OPPORTUNITY KNOCKS!

UNUSUAL SALES OPPORTUNITY

with small, aggressive chemical firm selling special solvents to America's leading industrial plants. Must have good chemical education or solvent selling background. Executive ability important. Starting salary modest, with great opportunity for advancement and sizeable commission earnings. Write for appointment, briefly outlining qualifications.

P-7426 Chemical Week
330 W. 42 St., New York 36, N. Y.

CHEMICAL SALES

Leading, progressive national manufacturer of agricultural and industrial chemicals needs several aggressive technical sales representatives with chemical, agricultural or mechanical engineering training between the ages of 25-35 preferred. Field assignments made after completion of sales and technical training program.

Send complete resume showing education, past experience and other pertinent data, also preference of location to

BW-7422 Chemical Week
330 W. 42 St., New York 36, N. Y.

REPLIES (Box No.) Address to office nearest you
NEW YORK: 330 W. 42nd St. (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

Positions Wanted

Public Relations Director or Associate, 29, B.S., chemist with wide and outstanding P.R. and publicity experience. Creative; self-starter. Many important contacts. Will accomplish profitable, far-reaching results. Box C 934, 300 W. 43 St., N.Y. 36.

Maintenance or Plant Engineer, B.S. Chem. Eng. 1941 experienced in plant engineering, project engineering, plant construction and plant utilities. Thoroughly familiar with selection and evaluation of plant equipment, water treatment and fuel technology. PW-7354, Chemical Week.

Freight traffic manager, over 20 years industrial experience. Record available. ICC practitioner. College grad. In deadend position today. Current salary \$10,000. PW-7406, Chemical Week.

WANTED

CHEMICAL REPRESENTATION

Long established chemical distributor located in N. Y. C., also known for his market development ability, seeks additional line of chemicals to distribute. Can offer conscientious service plus experience. Highest references.

RA-7414 Chemical Week
330 W. 42 St., New York 36, N. Y.

chemical process industries

EMPLOYMENT

Manufacturer's Representative — With well established contacts in chemical and allied fields. Territory consists of Missouri, Kansas, Oklahoma, Iowa, Nebraska and North Texas. Can handle additional lines of either raw materials or packaged specialties. RA-7250, Chemical Week.

Manufacturer's Representative, located New York, covering chemical specialty, various industrial, processors, Baltimore to Boston desires one additional line. Wide application experience. RA-7330, Chemical Week.

EQUIPMENT—used-surplus

For Sale

FOR SALE

ORTHO-ETHYLNITROBENZENE

Major chemical company wishes to dispose of approximately 1,500,000 pounds by-product material.

Will listen to any reasonable proposition. Boiling point 228°C; crystallizing point approximately -12°C; specific gravity 1.1; yellow to green clear liquid; high assay.

Good for miscellaneous solvent uses. Possible substitute for nitrobenzene or nitrotoluene.

Address inquiries to

FS-7373 Chemical Week
520 N. Michigan Ave., Chicago 11, Ill.

FOR SALE

WELDING WIRE

Hastelloy W—size 3/16" round. Quantity 10,000 lbs. Condition new. Far below mill price for any quantity.

BOND METAL SURPLUS CO.

321 Canal Street, New York City

Patterson Fdry. 6' dia. x 8' long "DJ" Jack-
eted steel ball mill, 40 HP Expl. Pr. Motor.
Unused. Perry Equip. 1415 N. 6th St., Phila. 22,
Pa.

Stokes 150 gal. T304 stainless steel jacketed
vacuum still. Perry Equip. Corp., 1415 N. 6th
St., Phila. 22, Pa.

Type 316 stainless steel sched. 40 pipe, 2 1/2"
IPS—approx. 440 ft. Unused. Perry Equip., 1415
N. 6th St., Phila. 22, Pa.

For Sale: New, Unused 940 gallon monel sul-
fonator 62" x 72" with bolted on head with 147"
1 1/2" schedule 40 monel pipe coil with 4" bottom
outlet Mixing Equipment Co. Agitator drive model
116-TEC-51, 5 H.P. Exp. P. Motor, \$5000.00
F.O.B. Shipping Point. FS-7407, Chemical Week.

For Sale—53-gallon drum of Tributyrin (Tenn-
csee Eastman Product) at half price. FS-7434,
Chemical Week.

Ammonia Compressors—York 10x10 Model DB,
used less than 2 years, erected in Pennsylvania
brewery, with all accessories, can be purchased
separately at a real bargain; also York 11 1/2 x 10,
108 Ton cap., connected to 175 HP, 360 RPM,
220 Volt, 60 cycle, 3 phase motor, installed new
Jan. 1949; also two Frick 6x6 compressors with
"Ideal" 30 HP motors, and 1 York 8x8 com-
pressor, with 25 HP motor; all at real bargains.
FS-7358, Chemical Week.

Filters—2 Niagara slurry filters, 440 sq. ft.
ca., with one closed water feeders and Niagara
stainless steel leaves and quick opening covers;
in operation, but plant being liquidated. Details
upon request. FS-7359, Chemical Week.

Filtration Headquarters—We are known as head-
quarters for diatomaceous earth filters and have
available 15 Niagara, Kleib, Butler, Bowser,
Enzinger, etc., powder filters; areas from 50-550
sq. ft., with stainless leaves, open or closed slurry
feeders, etc. No matter what your filtration
requirements, write to "headquarters", Chas. S.
Jacobowitz Corp., 3080 Main St., Buffalo 14, N.Y.
Phone Amherst 2100

Tanks—4—A. O. Smith, one-piece, glass-lined
tanks, approx. 17,000 gal. cap., ea.; 3—same as
above, slightly smaller, and 3—same, 5100 gal.
ea.; all linings first class shape; also Klein
stainless steel diatomaceous earth filter, total
area 160 sq. ft. FS-7361, Chemical Week.

U.S. Bottlers Rotary Air Cleaner—New, never
used, will handle 32-oz. steinie type bottles; im-
mediate delivery, attractive price, cap. up to 160
bpm. Also, practically new Hartford-Empire
bottle rinser for 12-oz. bottles, located Brooklyn,
1/2 of new, guaranteed. FS-7362, Chemical Week.

Berry-Wehmiller Vortex Cooler — Cooler or
Pasteurizer, 42"6" long x 15"1" wide by 5"6" high;
can be moved in one piece, available for about
25¢ on the dollar, excellent condition with all
motors and accessories. FS-7363, Chemical Week.

CHEMICALS WANTED

BUYERS OF SURPLUS

CHEMICALS—OILS—SOLVENTS
DRUGS—RESINS—WAXES
PLASTICS—COLOR—ETC.

BARCLAY CHEMICAL COMPANY, INC.

75 Varick Street New York 13, N. Y.
WORTH 4-5120

SURPLUS WANTED

CHEMICALS, PHARMACEUTICALS, OILS
PLASTICIZERS, RESINS, DYES
SOLVENTS, PIGMENTS, ETC.

CHEMICAL SERVICE CORPORATION

96-02 Beaver Street, New York 5, N. Y.
HANover 2-6970

SURPLUS WANTED

Chemicals—Resins—Pigments—Solvents
By-products—Mixtures
Specializing in off spec materials

CHEMSOL, INC.

70 Dod Street, Elizabeth, N. J., EL 4-7654

PLANTS—PROPERTIES

For Sale or development chemicals plant, built
in 1951, French Morocco. Production absorbed
locally. Raw materials available locally. Engineer
designer would be placed at the disposal of buyers.
Price and terms to be discussed. Write Havas-
Rabat, Ann. No. 62 Rue Richelieu.

SPECIAL SERVICES

Truland Chemical & Engineering Co., Inc.

AVAILABLE CUSTOM REFINING FACILITIES

Distillation, Extractions
Separations, Fractionations
WANTED All types of Crude Mixtures
Drum Lots - Tank Cars
By-Products, Residues, Wastes
Contaminated Solvents

Box 426, Union, N. J. Murdock 6-5252

CUSTOM GRINDING

- Ultra Fine or Coarse
- Specialty or Volume
- Complete Blending and Grinding
service on unit or contract basis
- Heat Sensitive Materials

A. Cramer Corp. 10881 S. Central Avenue
Box 682 Oak Lawn, Illinois

PRODUCTION

during the elution. Spedding's original process called for elution with citric acid. More likely for commercial operation, however, is a later refinement that requires elution with an ammonium salt of ethylenediamine-tetracetic acid (EDTA). By adjusting the variables, products of varying purity can be made. Lindsay, for example, says it can turn out products of 95% purity. Or it can go as high as 99.99% pure.

Other means of separating the rare earths depend on fractionation (precipitation, decomposition, crystallization). But these are, at best, tedious and cumbersome. Here's why:

The rare earths differ from each other only in the number of electrons in an inner (4f) orbit. They all have three in the outer one; hence their chemical activities are practically identical. Their only dissimilarity of properties is due to a slight variation in densities of the atoms because of different positive charges on the nucleus.

The very similarity in properties that makes them difficult to separate is a valuable asset, of course, in studies of the relation of behavior of an atom to its nuclear density. Other uses and applications of the pure rare earths may open up now that they'll be "commercially" available.

EQUIPMENT

High-Purity Aluminum: Kaiser Aluminum & Chemical Corp. (Mead, Wash.) is now producing commercial quantities of 99.99% pure aluminum—a grade that has previously been obtained largely from foreign sources. Superpurity aluminum is available in pig form to manufacturers of catalysts for chemical and petroleum industries, in rolled foil (99.99% pure) for electronic component applications.

Pilot Regulator: A. W. Cash Co. (Decatur, Ill.) has just brought out its Type 51 pilot valve, which permits regulation of temperature as well as of pressure. Pressure-sensing elements are made for ranges from 0-15 to 0-10,000 psi., and 0-30-in. vacuum. Mercury-actuated temperature-sensing elements operate over the range of -40 to 1000 F. Type 51 pilots are available separately or mounted on Cash standard control valves.

PRODUCTION

Wet-or-Dry Collector: A new power-driven dust collector, developed by Majac, Inc. (Sharpsburg, Pa.), utilizes multiple, rotating deflector plates to reverse direction of air flow and drop out heavy particles from dust-laden air. Centrifugal force removes 100% of fine particles down to 0.5 microns in dry collecting, to 0.1 microns in wet operations. Collectors are available in 13 sizes with gas throughputs ranging from 300-30,000 cfm.

Close-Coupled Motor: Built to related NEMA specifications (CW, May 21, p. 105), Uniclosed motors by U. S. Electrical Motors, Inc. (Los Angeles) pack more horsepower into less space on close-coupled centrifugal pumps. Other features include: Ventrifoil de-

flectors to direct air and deflect water, Lubriflush system of lubrication. Sizes range from 1-30 hp.

pH Electrodes: Beckman Instruments, Inc. (Fullerton, Calif.) is now incorporating its Type E-2 pH-sensitive glass into electrodes used for laboratory and process control. Unlike the older units, which they replace, E-2 electrodes are usable over the entire 0-14 pH range at temperatures from 15 - 100 C., offer improved resistance to acids, alkalis, aging, and surface deterioration.

Plastisol Dispenser: Mercury Industries, Inc. (Hillsdale, N.J.) has just placed on the market three dispensing units, specially designed to handle vinyl plastisol: Model AD allows in-

finite adjustment for automatic discharge of quantities from 15 to 1,600 grams; Model AD-E permits instant adjustment from one measurement to another between 12 and 1,300 grams; Model MD is a manual, nonmeasuring bulk dispenser. All three feature special nondrip nozzles.

Absorption Refrigerators: Chilled water for process cooling installations can be provided at little operating cost, says Carrier Corp. (Syracuse, N. Y.), by the use of its new, large-capacity absorption refrigerating machines. Using no motors or major moving parts, the units can operate on low-pressure (12 psig.) steam or other fluid heat, such as hot water, hot oil or chemicals. Models are available in 11 sizes from 100-700 tons.

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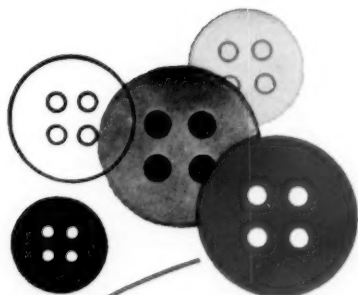
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BAKER PERKINS

SIZE 14 JNM2 UNIVERSAL MIXER

**—uniformly blends special vinyl compounds
for Auburn Button Works, Inc., Auburn, N. Y.**

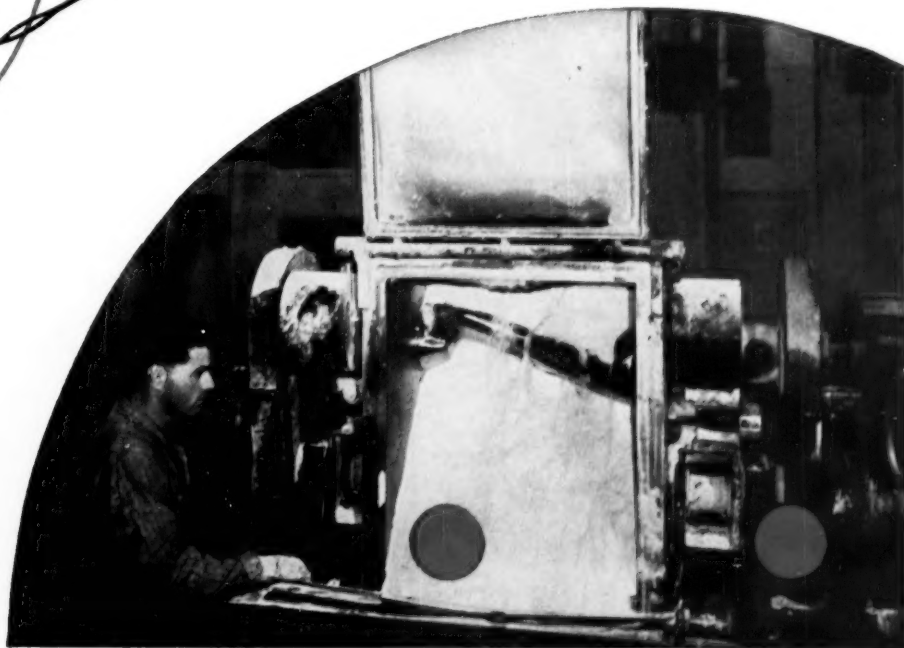
As an intermediate processor of raw materials for plastics fabricators, the Extrusion Division of Auburn Button Works in Auburn, New York, compounds and blends a wide variety of special vinyl plastic mixtures for its many customers. Thorough mixing and intensive kneading of the materials is necessary to insure a uniform blend with high tensile strength, good surface quality, retention of heat and light stability and other characteristics important in the finished extrusion. To obtain these characteristics, Auburn employs a specially designed Size 14 BAKER PERKINS JNM2 Universal Mixer with a working capacity of 50 gallons and a total capacity of 75 gallons. This machine is equipped with a trough shell of #304 stainless steel and is jacketed for 80 lbs. steam pressure. It has cast sigma blades with dispersion faces, cored for steam, and is driven by a 20 h.p., 900 rpm. motor.

BAKER PERKINS Universal Mixers are adaptable to virtually every mixing and kneading operation from very light to heavy duty, handling mixtures ranging in consistency from dry powders to stiff plastic masses. For complete information about Universal Mixers and other B-P equipment for the chemical processing industries, consult a BAKER PERKINS sales engineer or write us today.

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BAKER PERKINS INC.

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SAGINAW, MICHIGAN**



For **TOUGH**
Detergent
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Look at these advantages!

**Ideal
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A carefully-sized material made to meet exacting handling and formulating needs.

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Ideal for formulating with TSP, STPP, other phosphate builders.

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Alkaline**

An excellent general heavy-duty detergent. Extremely effective in inhibiting corrosion on aluminum when used in alkaline mixtures.

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Both bags and drums have special heavy-duty asphalt barriers to protect its free-flowing properties and prevent moisture pickup during shipment and storage.

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SODIUM
METASILICATE

Clear Solutions

Dissolves readily to give clear, sediment-free solutions.

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High Quality**

Extremely low in iron, other undesirable impurities.

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